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Breaking large fragments of magnetite ore at Jones & Laughlin's open pit at Star Lake, northern New York. See p. 88

The Mining Industry's Part in European Recovery — Page 70

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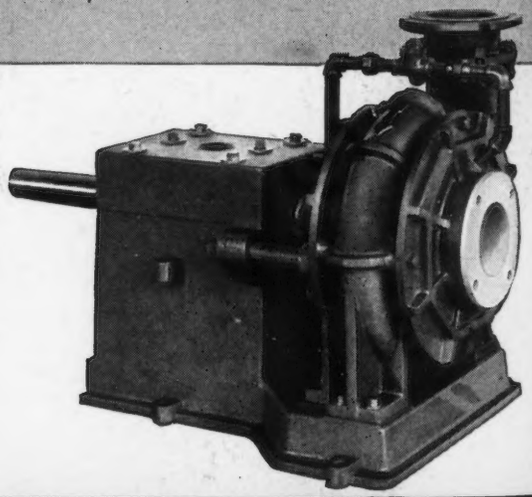

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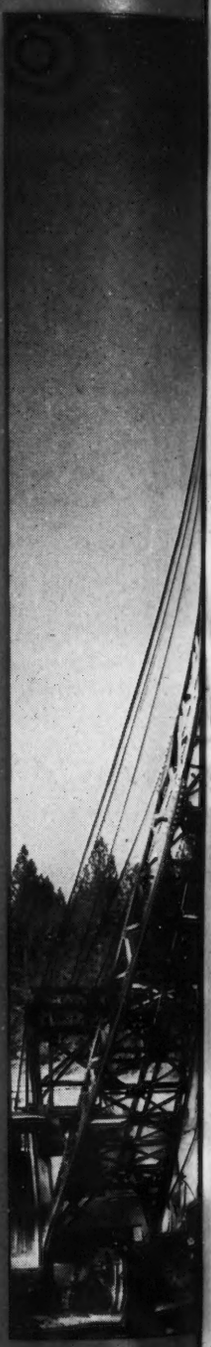

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ENGINEERING AND MINING JOURNAL

SEPTEMBER, 1948

Your Stake in the ECA

WITH THE ARTICLE by Tom Falco in this issue, we begin a series of articles designed to acquaint our readers thoroughly with the present status and the probable future of the mining industries of the Western European nations and their colonial dependencies. These are the nations whose recovery the United States is trying to bring about through the Economic Cooperation Administration (Marshall Plan).

Appearing in succeeding issues of *E. & M. J.*, these articles will show, country by country, not only what the United States can do to help the mining industries of these countries back to their feet, but also what they can do to help the United States get some of the critical materials it needs.

These articles will be presented to our readers because we believe the proper administration of American aid in European recovery is the most important question that will face the American people in the months just ahead. Our citizens and our legislators must review the work of the ECA thus far, and must decide how best its mistakes can be corrected in the future and its successes furthered. They must do this in the knowledge that failure to make the right decisions may again bring into play those weapons of all-inclusive destructivity which mankind now possesses, and with which it could destroy itself.

Therefore, we will attempt to furnish our readers with as accurate and authoritative a picture as we can of that side of the European Recovery Program that we know best, namely its relation to the mining industry. By so doing, we hope to supply a basis for intelligent decisions taken in the national interest.

In assembling this information, we look for not only those things that foreign mining industries will expect, and are getting, from us, but also those things that the United States may rightfully expect in return. In fact, the first article in this series, which appears in this issue, deals with that very topic. It describes the working of the ECA's Strategic Materials Division, the only branch of the ECA that is charged with a responsibility to encourage some return of the aid America is sending abroad.

Our readers will be interested particularly in the Strategic Materials Division for two reasons: 1, the greater part of its activities will deal directly with metals and minerals; 2, it is directed by Evan Just, a man thoroughly familiar and sympathetic with the problems of the domestic mining industry.

As outlined in Mr. Falco's article, the Strategic Materials Division has a three-fold mandate from Congress. First, it is to acquire strategic and critical materials from the ECA countries for stockpiling here, or for "other purposes". Second, it is to find ways of expanding foreign production beyond foreign needs of those materials in which the United States is deficient. Third, it is to see that United States enterprises receive treatment in the development of foreign resources equivalent to that accorded to the nationals of the countries concerned.

In the light of the national interest, one can not quarrel with any of those objectives, and the third point in particular seems an excellent one. The ECA will have accomplished much if it can secure for our mining companies the open door to foreign mineral development that many of them have sought and been denied, whether by legal or surreptitious means. We believe, in fact, that the only logical avenue to a peaceful world is to have universal open door policies for colonial areas.

After all, the very name of the agency suggests that aid to Europe cannot be regarded as a one-way street. Loans to ECA countries must be regarded as only a means to help them help themselves, and their opportunities to return the favor must not be overlooked. Cooperation, in short, is the very essence of the agreement to which our country has already contributed over a billion dollars of its citizens' funds. In return, the United States asks only a willingness to work with us toward a peaceful and productive world.

To sum it up, we are in sympathy with the objectives of the ECA, simply because we are convinced that Americans can no longer live isolated in a world of jet propulsion and atomic power. Nor can we live comfortably in a proverty-stricken world, or in a world over-run by Communism.

We therefore feel that we have no choice but to do our best to rebuild that world and knit it together in the way that seems best for all. We can only hope that the agencies like the ECA to whom that responsibility has been delegated will administer it wisely and well.

More Publicity Needed for Iron Ore

NEVER HAS A GREATER EFFORT been made by industry to persuade the public to a sympathetic understanding of its problems than is being put forth today. This is notably true in the steel industry where the position and acts of the largest corporation have been explained by top management at frequent intervals in carefully prepared press releases. We should like to believe that the operators in general are taking a long view and are choosing what they think is the best possible course with respect to the future.

In this surge of publicity, no topic has had a greater airing than that of the steel makers' iron ore supply. It has been discussed at extraordinary length. In our issue of October, 1946, p. 72, we said: "Public concern about depletion is proper but there is no cause for panic. The day of exhaustion for this reserve is indeed approaching, as for every mine and mining district everywhere. The industry is aware that a mine is a wasting asset and has been making its preparations. It is the public that has needed educating." By and large, the steel industry has access to a supply of ore that should be ample for at least some decades to come if all domestic sources be counted as well as those foreign resources that have already been tapped or are being opened up for mining. If some mine operators at home should find their reserves nearing exhaustion, that will not be a national catastrophe but rather the eventual fate of every mining operation. Mankind just does not worry about future generations beyond a certain point. Too many things can happen in between.

From New York's important iron ore reserve will come an increasing supply of high-grade product for making steel. This activity is already providing employment and adding to the State and national wealth. At the furnaces, the New York output is supplementing the supply of Lake ores, much needed these days of maximum demand. It will also add stability to the country's ore supply whenever the Mesabi's production begins to fall. Activities of two of the Adirondack operators get some attention in this issue. On pages 88 and 89 are the first photographs yet to be released of Jones & Laughlin's Benson mines at Star Lake. On page 101 certain recent activities of Republic Steel Corporation in Essex and Clinton Counties are described and more will be told in another issue.

All in all, an effort is being made by the steel companies to inform the public on the vital character of the industry that mines its iron ore. Repetition is necessary, memories being short. The public must be cured of the notion that a mine is a treasure house from which profits are extracted freely. The more the public understands the problems of the mining industry, the better the industry is likely to fare in legislative chambers when matters affecting it importantly arise.

Smart Salesmanship in the Phosphate Field

WHEN THE Hoover & Mason company, phosphate producers of central Tennessee, recently dispatched 51 cars of finely-ground raw rock to the farmers of Jersey County, Illinois, in a single shipment, an incident was created which should give every miner of non-metallic minerals something to think about, if not to envy. Every producer is interested in extending the use of his product or finding new uses for it. The problem is to do it.

In the case cited, the producing company had capitalized the growing demand for raw rock by confining its efforts to producing it and was marketing it through long-established channels. In addition, in the fertilizer consuming area, there was a competent farm adviser and various organizations and individuals to weigh the advice, pass it around, and get collective action. As the story runs, the adviser, concluding that phosphorus was the factor limiting crop production on most of the land in his county, contacted a sales representative who explained to Farm Bureau committees, A.A.A. committees, and other agricultural leaders the advantages of phosphate replacement through the application of finely ground rock. The State University promoted the idea. Radio and press lent publicity. Encouraged by their leaders, the farmers became enthusiastic. The trainload was shipped. The order came from 170 individuals, over half of whom had never used phosphate rock before. The news got around. Subsequently an even larger trainload of raw rock was shipped into another state, going however to several counties instead of one.

The main lesson is that the producer must study his market possibilities, watch his competition, educate prospective customers. A large number of the farmers mentioned simply needed further education to make them ready to buy, despite the publicity already given to the need for restoring the soil's fertility. Too many miners of non-metallics would be in a difficult position if their present outlets should dry up.

New Incentives Needed

By WORTHEN BRADLEY
President, Bradley Mining Company, San Francisco, Calif.

WORTHEN BRADLEY

THIS SUBJECT has been so well and so often aired that an unbiased observer could not be blamed for feeling that the mining industry "doth protest too much." Assuming that such skepticism does exist, I will undertake replying to it in the form of answers to questions put by a hypothetical lay reader, or "straight man":

Q. Is it true that mine development has become unpopular with venture capital?

A. Yes, in many formerly active areas in the Western states, there is now almost a complete absence of development.

Q. What is the reason for this discouraging condition?

A. There are as many reasons as there are metals and Government bureaus. There is exhaustion of ore, a cause overemphasized by the conservationists, who in turn deprecate the importance of ore reserve development by a thriving mineral industry. In gold, there is its fixed price vs. prevailing high costs. But there is one overlying reason, particularly in strategic metals: it is the feeling of mining men that the Government considers their industry expendable.

Q. What evidence do you have for that?

A. There are several examples. The State Department, for instance, sponsors foreign trade agreements which include tariff concessions on the part of the U. S. Where such a concession applies to a metal, the domestic price of that metal usually suffers a corresponding decline. This naturally does not encourage domestic mining and development of that metal.

Q. Name a specific metal.

A. Tungsten is the best example. A 24% tariff decrease took effect in mid-1948, followed by an approximate 20% decline in domestic price. There is only a handful of domestic operators left to discourage, and needless to say no extensive tungsten development is being planned.

Q. How about another general example?

A. Taxes. Most mining men would put this first on the list. The reforms needed were so well summarized in the leading editorials on pages 71 and 67 of the May and July issues, respectively, of the *E. & M. J.*, that I will not attempt to add more to the subject at this time.

Q. Would incentive payments help remedy the general situation?

A. Such payments are really subsidies, which I am against in principle. However, I have to admit that if properly timed and administered, incentive payments might account for a small additional production and development, as they did during the war. But I doubt that the payment program can be put through Congress.

Q. Is the general situation in mining really so utterly discouraging? And if so, what can be done about it?

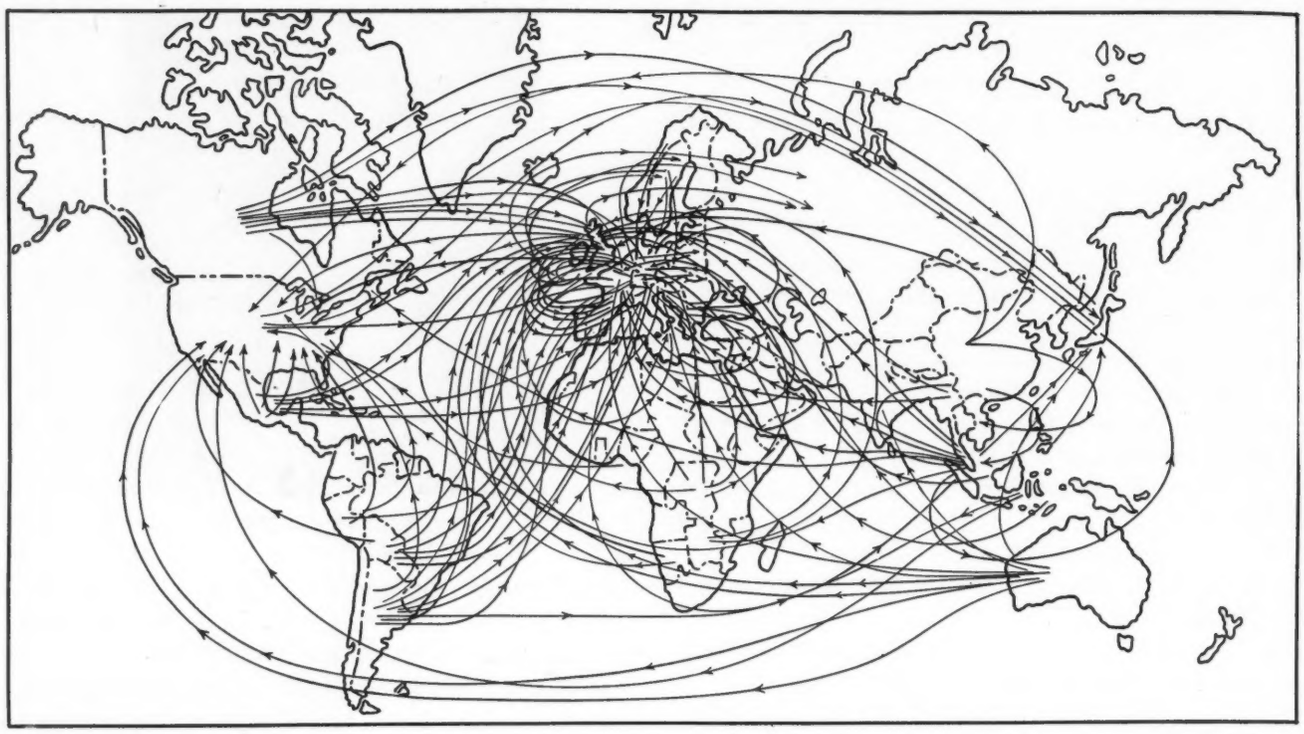
A. The picture is not entirely black. If it were, there would be no Greater Butte Project, and on down the scale, there would be no smelter construction by my company. Building a smelter indirectly creates ore, for development cannot lag when there is a furnace to feed (and pay for).

Q. Okay, then there must be some encouraging factors. What are they, and what can be done to strengthen and increase them?

A. It is encouraging to realize that there are more than a few people on our side. Some of these are men in public office, whether elected or appointed, and some are advisors to these men. They all are aware that if our mineral industry is accorded sympathetic treatment, it need not be written off as defunct. They share the belief that a healthy mining industry should be considered as actually part of our national stockpile of metals, and indeed the base of such a stockpile. They encourage us by continuing to hammer away at tax reform, at limitations on tariff cuts (note the bill extending the Trade Agreements Act), against overtime-on-overtime and other inflationary evils, and for a fairly administered public land policy, to mention a few things.

These are all pieces of a reform movement which is of benefit to mining, but which will take time; there is no one thing that can be done to work miracles overnight. It is rather a state of mind that must be fostered. We should all individually, or through our mining societies—and without necessarily becoming vituperative toward "The Government" which is, after all, subject to change—continue to fight the good fight for these reforms, and steadfastly to support their advocates.

PEACETIME PATTERN OF WORLD TRADE IN MAJOR METALS AND MINERALS



COOPERATION BETWEEN NATIONS will be needed to restore this peacetime (1938) world trade pattern in major non-ferrous metals.*

ECA's Strategic Materials Division

Mining men will be specifically interested in two phases of the European Recovery Program discussed in this article: 1. ECA's responsibility, through its Strategic Materials Division, to help stimulate production of strategic materials, and to aid in the purchasing of them for stockpiles. 2. The extent to which metals and ores enter into the $6.7 billion financing program tentatively outlined for the 15-month period of April 1948 to June 1949, inclusive.

TOM FALCO, Washington Bureau, McGraw-Hill Publishing Co.

A GREAT DEAL has been said about what the U. S. is to give Europe and China under the Marshall Plan, but very little has been said about what the U. S. is supposed to get in return. Strategic materials are a case in point.

Under the Foreign Assistance Act of 1948, also known as the ECA (Economic Cooperation Administration) Law, the Marshall Plan countries are pledged to work hand in hand with Hoffman's organization toward building up our stockpiles of needed materials—tin, rubber, bauxite, copper, cobalt, sisal, industrial diamonds and scores of other hard-to-get minerals and materials that are vital to national defense. Aside from the U. S., increasing the flow of such materials will help Marshall Plan countries through whatever dollars are spent for that purpose and through generally building up materials output.

That's why ECA has a Strategic Materials Division. It's relatively new, having been organized in July. Its functions are many and the problems it faces are manifold. Thus many months may pass before the division gets into stride. But once that time comes, it will be making lots of news both in and outside the mining industry. If expectations are fulfilled, the Strategic Materials Division—in cooperation with ECA countries—will have a hand in spending hundreds of millions of dollars a year in many parts of the world—from the African Bulge and the Caribbean to the Pacific Islands of the Far East (Map, opposite page).

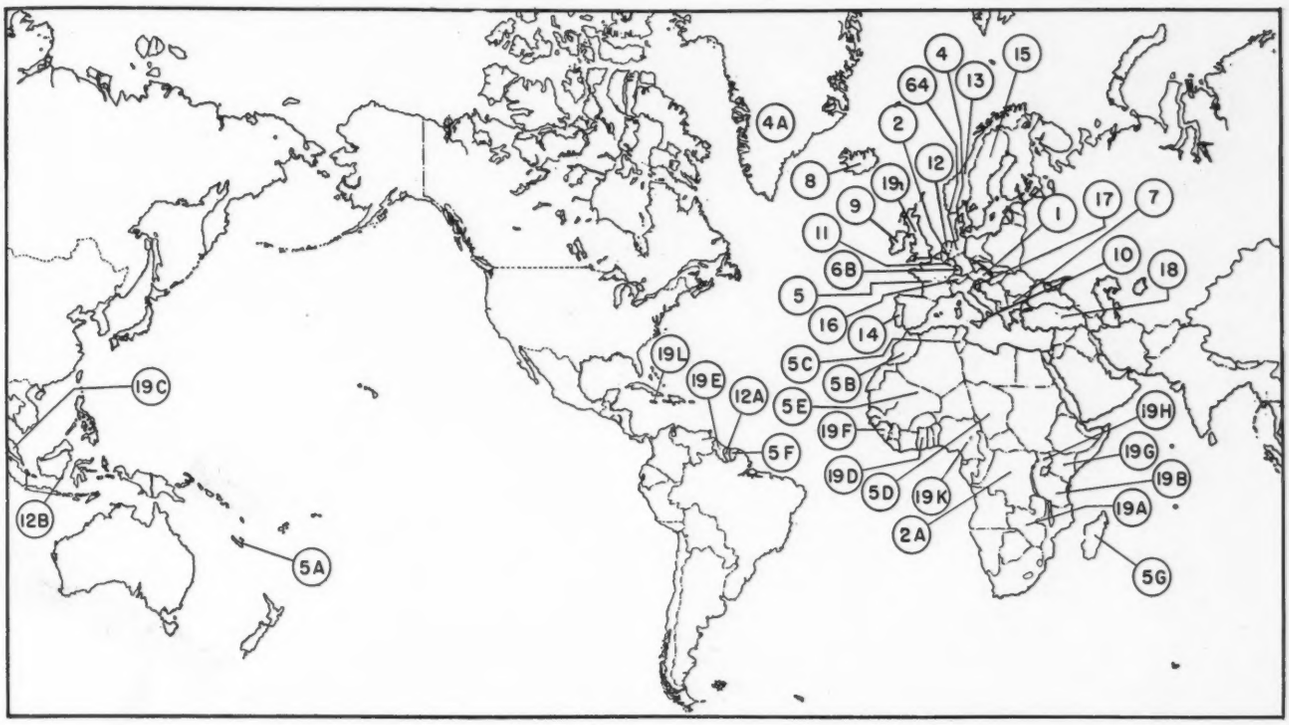
Judging from ECA's legislative mandate, the Strategic Materials Division will have three main jobs. In doing them it will have to combine the functions of a troubleshooter, watchdog, diplomat and investment counselor. A quick look at each of these jobs shows why:

1. The division is to facilitate "the transfer to the United States . . . for stockpiling or other purposes . . . and upon reasonable terms and in reasonable quantities, of materials which are required by the U. S. as a result of deficiencies or potential deficiencies in its own resources. . . ."

In carrying out this portion of

*Lines in the above map represent the movement of more than 1 or 2% of the World's trade for 1938 in each of the following items: Copper, ore, matte and concentrates; refined copper; lead ore and concentrates; refined lead; zinc ore and concentrates; refined zinc; tin ore and concentrates and refined tin. Adapted from data in "World Minerals and World Peace" by C. K. Leith, J. W. Furness, Cleone Lewis. Published by Brookings Institute.

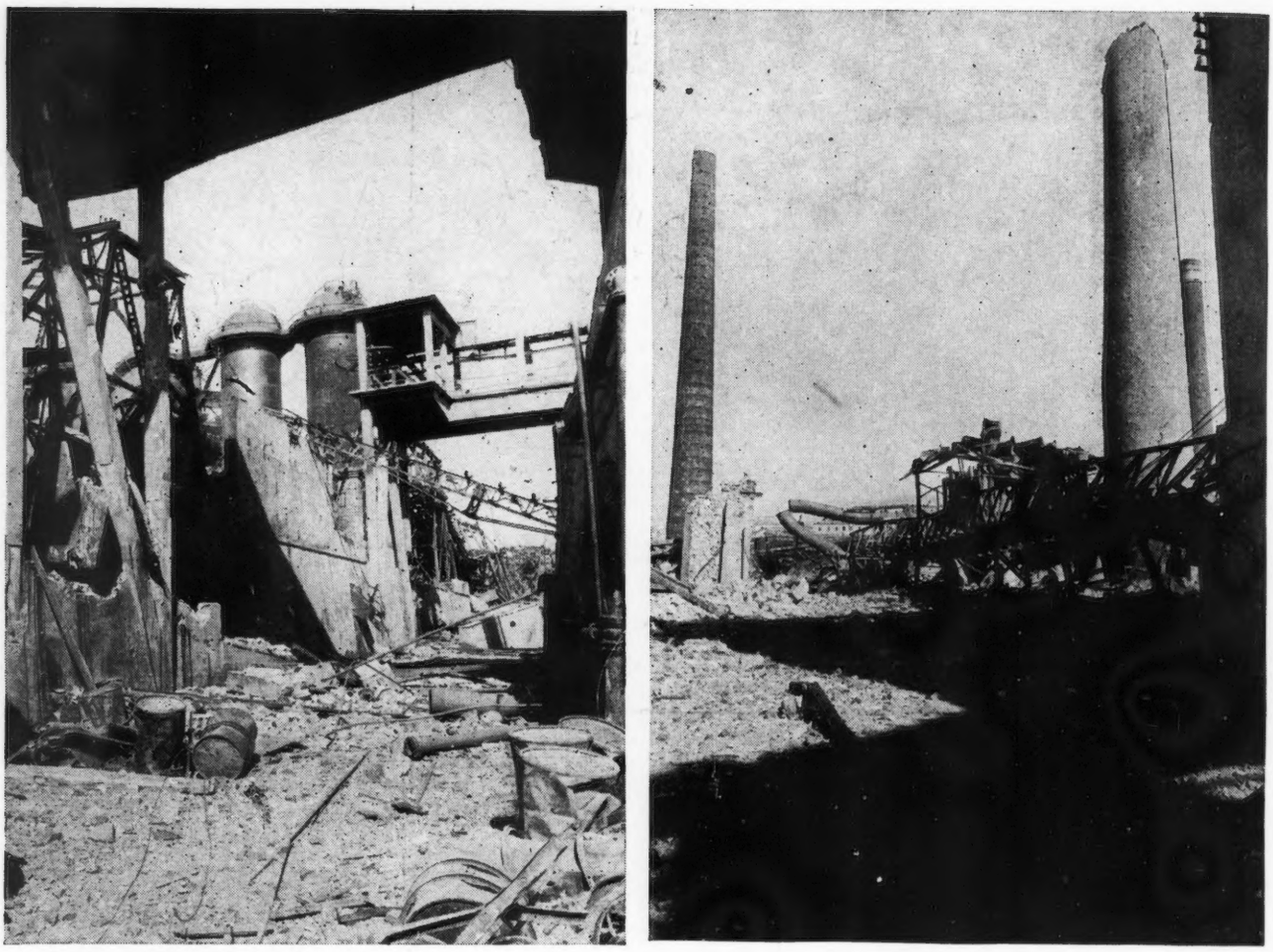
ECA COUNTRIES AND DEPENDENCIES



Where ECA May Buy Strategic Materials

COUNTRY (Also dependencies and colonies)	STRATEGIC MATERIALS
1. Austria	
2. Belgium	
2A. Belgian Congo	Copper, tin, cobalt, industrial diamonds, zinc, tantalum, columbium, uranium, cadmium, pyrethrum, vegetable oils
3. China	Antimony, tin, tungsten
4. Denmark	
4A. Greenland	Cryolite
5. France	
5A. New Caledonia	Chromite, nickel
5B. Morocco	Lead, cobalt, manganese
5C. Tunisia	Lead, cobalt
5D. French Eq. Africa	Lead, zinc, copper, tin, diamonds
5E. French W. Africa	Manganese, vegetable oils
5F. French Guiana	Bauxite
5G. Madagascar	Graphite, mica
6. West Germany	
6A. Bizone	Steel scrap
6B. French Zone	
7. Greece	Bauxite, lead
8. Iceland	
9. Ireland	
10. Italy	Antimony, cadmium, lead, zinc, mercury
11. Luxembourg	
12. Netherlands	
12A. Dutch Guiana	Bauxite
12B. Dutch E. Indies	Tin, rubber, cordage fibers, petroleum, pepper, bauxite, nickel quinine, vegetable oils, manganese
13. Norway	Zinc, aluminum
14. Portugal	Beryllium, tungsten, tin
14A. Mozambique (Port. E. Africa)	Corundum
14B. Angola (Port. W. Africa)	Industrial diamonds
15. Sweden	
16. Switzerland	
17. Trieste	
18. Turkey	Antimony, chromite, manganese, bauxite, petroleum
19. United Kingdom	Tin, china clay
19A. Northern Rhodesia	Copper, chromite, cobalt, zinc, lead, mica, vanadium
19B. Tanganyika	Lead, mica, industrial diamonds
19C. Malaya	Tin, vegetable oils
19D. Gold Coast	Bauxite, manganese, industrial diamonds
19E. British Guiana	Bauxite
19F. Sierra Leone	Manganese, industrial diamonds, chromite
19G. Kenya	Pyrethrum
19H. Uganda	Beryllium, titanium, tantalum
19K. Nigeria	Tin, tantalum
19L. Jamaica	Bauxite

TWO REASONS FOR ECA: 1. TO HELP RESTORE EUROPE'S ECONOMY . . .



ECA HOPES TO HELP restore Europe's war-damaged economies. These are bombed metallurgical plants in Italy.

the ECA law, the Strategic Materials Division will be acting chiefly as an expediter, especially to satisfy Uncle Sam's stockpile requirements. As such, it will work with manufacturers and the Commerce Dept. to see that needed production and transportation equipment goes where it'll do the most good—whether it's mining machinery for getting more tin and bauxite, or rolling stock and port machinery for moving any of a number of strategic materials to market.

To Aid Stockpiling

To this extent, the division puts a new head of steam behind the government's five-year, $3.2-billion stockpiling drive. That's now in its second year and is being carried out by the Treasury's Bureau of Federal Supply, operating under instructions of the munitions board of the National Military Establishment.

So far, because of high prices and equipment shortages—the result of booming world demand for minerals and other materials—the munitions board hasn't been getting anywhere near the quantity of strategic stuff it would like to see this country stow away against a future emergency.

In the current fiscal year, Congress appropriated $600 million dollars for the board's stockpiling work, half of it for long-term contracts running up to five years. This money is available for purchases either in or outside the Marshall Plan area. It is expected that the bottleneck-busting work of the Strategic Materials Division will make it possible for the Bureau of Federal Supply to speed up its buying. While ECA holds the purse strings of dollar aid, a lot of countries will see to it that their producers pitch in and help put our stockpile program across, at the same time that they expand the overall supply of needed materials.

2. The division is to see that specified ECA funds, whether in local currencies or dollars, are used to expand the production of materials "which are required by the United States as a result of deficiencies or potential deficiencies" in its resources.

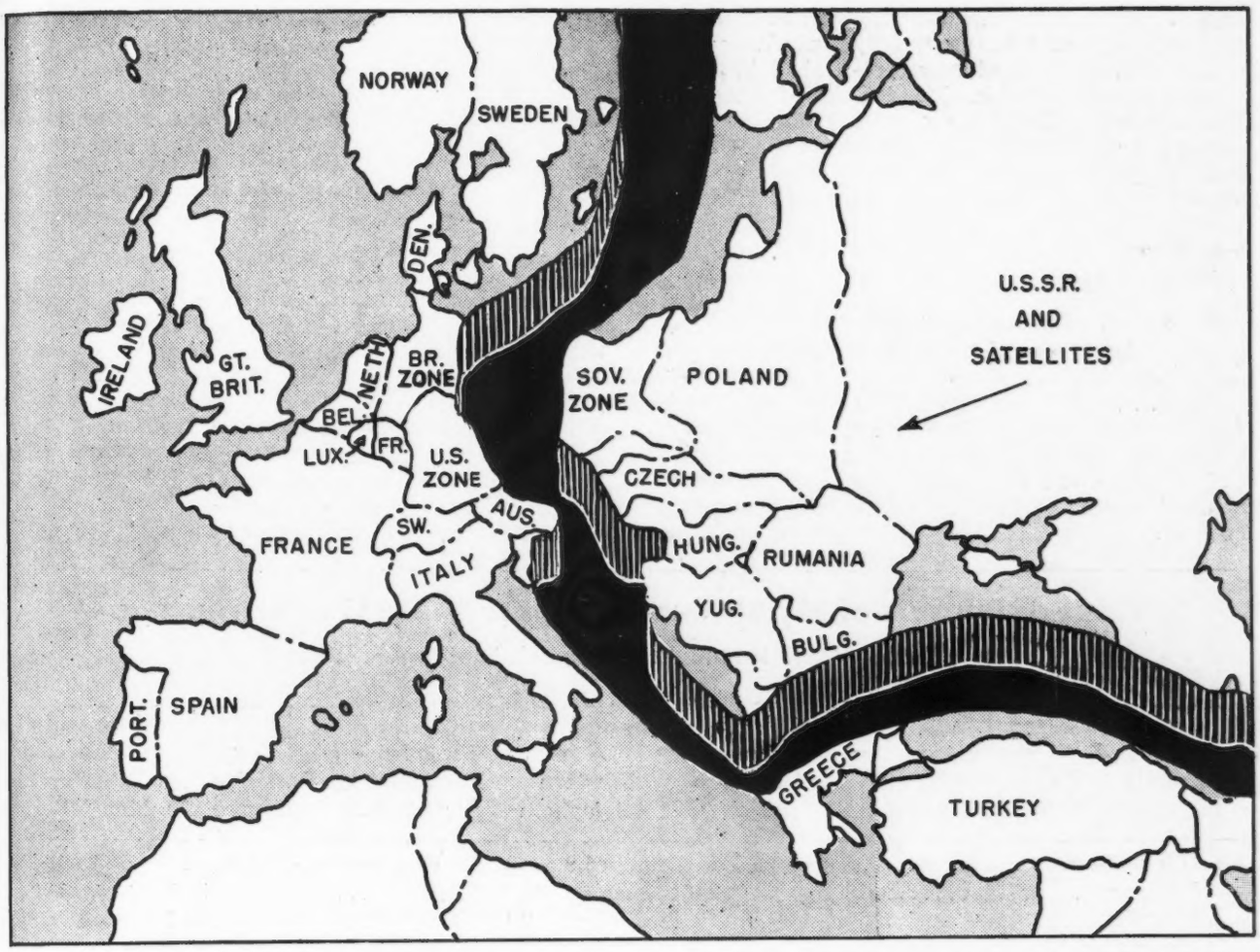
When Congress finally appropriated the billions of dollars for ECA's first year, it tucked in a provision aimed to sew up at least some of the natural wealth available from Marshall Plan nations, and particularly their colonies throughout the world.

That was done by requiring ECA countries to make available not less than 5% of the local currencies they're to set aside, against the dollar help they receive in the form of grants, for "use of the U. S. Government for expenditure for strategic materials . . . or for other local currency requirements of the United States of America."

$180,000,000 to Spend

As a result of this provision, it is estimated that Hoffman's men may have the equivalent of some $180 million dollars to spend for stockpiling purposes in ECA countries and their colonies and dependent areas. In addition to straight purchases of available copper, tin, rub-

2. TO KNIT WORLD DEMOCRACIES UNTIL THIS RIFT IS HEALED



IN THE FACE of world political division, America's stockpiles of strategic materials must be replenished.

ber, vegetable oils, bauxite and other materials, these earmarked funds are expected to go into capital investments designed to expand the production of needed materials of all kinds.

Thus Dutch guilders may go to build up tin output in Sumatra; Franch francs to increase production of mica in Madagascar; Turkish liras to step up chromite mining in Turkey; and British sterling to expand manganese output on the Gold Coast of Africa.

In one case, the earmarked funds may go into plant expansion; in another to modernization projects; in still another, to new developments and exploration.

Not Much to Buy

In writing this part of the ECA act, Congress was fully aware that the production of strategic materials in Western Europe is currently less than its overall requirements so that the countries themselves could spare little for our stockpile.

True, in many Marshall Plan areas there was plenty of strategic stuff for the getting. But in addition to transportation bottlenecks, uncertain political and economic conditions were enough to keep investment capital sitting in the storm cellar. It was only by providing some means of financing an expansion in present output that the U. S. could afford to cut itself in without reducing the volume of strategic materials normally marketed in world commerce.

Investments in lifting production are not necessarily restricted to the 5% in earmarked funds. It may well turn out that some of the countries will use a portion of the remaining 95% in "blocked" local currencies to launch any one of a number of other expansion projects. Marshall Plan countries may also apply part of the $1 billion in ECA loans toward boosting strategic-materials output.

3. The division is to see that the U. S. gets fair treatment from ECA countries when it comes to buying, or developing new sources of, needed materials. This point goes back to the promises made by China and Western Europe to undertake certain fiscal, production, trade and other measures in return for Marshall Plan aid. It is of particular interest to our stockpilers, our mining industry, and consumer industries.

Open Door Policy

For one thing, the ECA countries agree to negotiate "a future schedule of minimum availabilities . . . for future purchase and delivery of a fair share of materials which are required by the United States as a result of deficiencies or potential deficiencies in its own resources at world market prices. . . ." This is by way of protecting American industry's access to needed materials—and at reasonable prices.

In the second place, ECA countries are pledged to treat American enterprise on an equal footing with their own nationals. This should encourage U. S. capital to launch new development projects in Western Europe or its colonial territories. It stacks up as a good bet be-

cause American nationals are eligible to apply to ECA for a guaranty of the convertibility of new, productive investments in Marshall Plan countries. Hoffman can raise as much as $290 million to assure that U. S. companies investing abroad are able to change into dollars the francs, sterling, or other local currencies they receive from approved recovery projects in ECA areas.

Finally, the various countries are to negotiate where practicable "an agreed schedule of increased production . . . and for delivery of an agreed percentage of such increased production to be transferred to the United States on a long-term basis in consideration of assistance furnished. . . ."

This clause gives us a look-in on whatever "surplus" materials Marshall Plan countries may come up with. Aside from that, it gives those countries a chance to repay a portion—if not all—of their ECA loans in strategic materials rather than dollars. This can be of special significance if our future tariff policies make dollars hard to get.

Hoffman's agency knows that it won't be easy for the Strategic Materials Division to put its three main jobs across. ECA legislation seems to give the recovery agency plenty of power, but that power is qualified by a number of technicalities.

For example, the law has much to say about offsetting "deficiencies or potential deficiencies" in U. S. resources. Would that extend to materials such as wood pulp or basic chemicals?

To take another case, consider the Recovery countries' obligation to expand production of strategic materials and to commit a portion for U. S. consumption. Exactly how do you go about assuring that a given nation will direct the output of its mining industry so as to fulfill that obligation and yet not impose undesirable controls on private enterprise?

Such problems can be multiplied. But they're puzzlers which—one way or another—ECA and the division will have to solve. If they don't, Congress will be wanting to know the reasons why when it gets to voting new money next year.

Value of Imports of Metals and Non-Metals Into Western Europe

(For Period of April 1948 to June 1949, Incl., in Millions of Dollars*)

Commodity to Be Imported	Where Commodities Will Come From (Value in Millions of Dollars.) From U. S.	From Rest of Western Hemisphere	Total from Western Hemisphere	From Non-Participating Countries	From Participating Countries	Amount to Be Financed by ECA for 15-Month Period
FERTILIZER	19.5	26.4	45.9	80.7	210.9	25.0
Nitrogen	16.4	26.4	42.8	...	51.3	24.0
Phosphate	3.1	...	3.1	23.4	139.1	1.0
Potash	...	...	...	57.3	20.5	...
RICH IRON ORE	...	8.4	8.4	8.3	91.1	...
NON-FERROUS METALS	52.3	348.7	401.0	140.6	221.8	250.3
Copper	30.7	127.7	158.4	13.4	110.7	107.3
Tin	...	37.7	37.7	8.4	62.6	...
Lead	8.4	80.1	88.5	84.6	2.3	75.5
Zinc	13.2	40.5	53.7	34.2	30.9	48.3
Aluminum	...	62.7	62.7	...	15.3	18.7

How ECA's Expenditures of $6.7 Billion Will Be Divided

(For period of April 1948 to June 1949, Incl.)

PARTICIPATING COUNTRY	ECA FINANCING (millions of dollars)	PARTICIPATING COUNTRY	ECA FINANCING (millions of dollars)
Austria	242.7	Portugal and dependencies	....
Belgium-Luxembourg and dependencies	378.2	Sweden	36.0
Denmark	169.4	Switzerland	....
France and dependencies	1,469.3	Turkey	12.8
Greece	137.5	United Kingdom and dependencies	1,670.6
Iceland	14.1	Western Germany	701.0
Ireland	150.0	Bizone	554.6
Italy	901.1	French zone	126.0
Netherlands and dependencies	777.7	Saar	20.4
Norway	42.1	TOTAL	6,702.5

*The above estimates are approximate and subject to change. They are based upon State Department and ECA statistics. Prepared to give Congressmen at appropriations hearings a rough idea of how ECA money is to be spent and where.

Science Illustrated Photo

USE the Geiger counter like this to check samples for radioactivity before sending them in as "uranium ore." For details, see text.

Uranium Ore

How To Go About Finding And Mining It

PAUL LEACH, JR.
Washington Bureau, McGraw-Hill Publishing Co.

A Prospector's Questions on Uranium Answered

1. **Do I need a license to look for uranium?**
   No, only a grub-stake and a Geiger counter.
2. **Where can I prospect?**
   Almost anywhere, few public lands are closed. For advice, consult the AEC or your State geologist.
3. **Do I retain title to the ore that I find?**
   Not for the uranium content. (See text for explanation.) You get a license from the AEC, sell your ore to the AEC depots, and report your production to the AEC. There is actually very little red tape.
4. **Does uranium mining pay?**
   Yes. You get $10,000 just for finding uranium, and the AEC pays good prices for the ore you mine.
5. **Where can I get samples tested?**
   By your State geologist, or send 10-lb. samples to the Raw Materials Division, Atomic Energy Commission, P. O. Box 30, Ansonia Station, New York 23, N. Y., or Grand Junction, Colo. (See text.)

THE DEVELOPMENT of the atomic bomb and subsequent advancement of atomic energy utilization in the United States has prompted yet another challenge to the mining industry. The U. S. is far from self-sufficient in the supply of uranium and thorium, the two radioactive materials which provide the spark for the atomic age. Uranium is considered the most important of the two.

Because of this shortage of the most critical material the country has ever known, the Atomic Energy Commission is calling on prospectors to get busy. In the 100 years since the Gold Rush to California, the old-time prospector has gradually seen his usefulness wane as scientific prospecting "gadgets" came into common use.

Now, however, there is an urgent

need for the prospector. But this time he, too, will use a "gadget"—the Geiger counter—to help him in his search for uranium and thorium. The very nature of occurrence of the two radioactive minerals makes the service of the old-time prospector mandatory. The country must be painstakingly searched for the outcroppings of uranium-thorium ore—and the prospector is just the man to do it.

No Red Tape

Those interested in developing radioactive mineral deposits should not worry too much about the "red tape" involved. Contrary to the countless rumors floating about, the Atomic Energy Commission has reduced the control and licensing procedure on uranium-thorium development to a minimum.

Basically, the facts are these: (1) a prospector needs no license to search for the two ores; (2) once a mineral deposit has been determined to be worthwhile, to sell his radioactive ore, the operator needs only an annually-renewable license, obtainable by filing with the AEC a questionnaire (AEC form No. 2); (3) when mining operations start, the operator reports his production and deliveries to processor-agents of the AEC to the Commission monthly (AEC form No. 3).

Only instance of involved procedure so far concerns filing of claims on uranium and thorium deposits. Under the Atomic Energy Act of 1946, title to these minerals is reserved to the Government. A board of Government attorneys is now working on a statement to explain the effect of the restrictions in the public mining laws.

In the meantime, however, the AEC frankly points out that there is nothing to prevent prospectors from filing a claim on a deposit based on some other known mineral in it. It is only rarely that either of the two radioactives occurs in a single mineral form; in most cases it is intermingled with some other known mineral on which a claim could be laid. As an example of this, claims on deposits containing the radioactive minerals in the Colorado Plateau are based on the vanadium content of the ore.

There are no special Federal taxes on uranium-thorium mining. The tax situation is the same as for any other mining venture.

The operator keeps his claim, and works it himself, on license from the Commission. As a matter of fact, the AEC wants the mining industry to develop this new side of the business, and promises all the cooperation at its disposal.

Uranium Pays Well

Counter-balancing the details the operator has to contend with is the lucrative side of the AEC's development program. The three "stimulating" parts of the program are: (1) Government-guaranteed ten-year minimum prices for domestic refined uranium, high-grade ores and mechanical concentrates, (2) a bonus of $10,000 for each separate discovery and production of high-grade uranium ores from new domestic deposits, (3) Government-guaranteed three-year minimum prices for the low-grade carnotite-roscoelite type uranium-vanadium ores of the Colorado Plateau, and Government operation of two vanadium-uranium concentration plants in that area.

The guaranteed minimum prices for the 10-year period are: Uranium-bearing ores and concentrates, $3.50 per lb. of recoverable uranium oxide. (U_3O_8), less the cost per pound to refine the necessary purity as determined by the AEC after assay of a representative sample; refined uranium products, $3.50 per lb. of uranium oxide.

The Commission, in announcing the pricing procedure, made these comments: "The prices established are minimum for small lots. Higher prices may be established by negotiation with the seller for larger quantities, taking into consideration such factors as refining and milling costs, transportation costs, and other applicable items. The Commission also will give consideration to the presence of recoverable gold, silver, radium, thorium and other valuable constituents of the ores, depending upon the cost of recovery."

"As a special incentive to stimulate prospecting for new high-grade domestic uranium deposits," the AEC says, "other than deposits of the so-called carnotite-roscoelite ores, the AEC will pay in addition to the prices established under the purchase schedule, a bonus of $10,000 for the production, upon delivery to the Commission, of the first 20 short tons of uranium ore or mechanically produced concentrates assaying 20% or more uranium oxide from any single lode or placer mining location on the public domain which has not previously been worked for uranium, or from a comparable area on private property. The discovery bonus will be paid only once for the production of ore from any single lode or placer location, but the same person may receive a bonus for the production from each new location.

"Although this offer does not apply to production of carnotite or roscoelite ores, a special development allowance in addition to the base price has been provided to encourage discoveries of such ores," the AEC states.

In the Colorado Plateau area, the Commission guarantees a minimum price schedule for delivery to it of carnotite or roscoelite type ores at Monticello, Utah, or Durango, Colo. The minimum prices, effective for three calendar years, are the highest per ton of average ore ever paid in that area. Independent producers are currently receiving $13.80 per ton from private industry for ore containing 2% vanadium oxide and 0.2% uranium oxide. Under the AEC schedule the producers will receive $22.40 per ton for this grade ore. The prices established by the Commission are based upon a "comprehensive study of mining costs, current and past prices paid for ores by vanadium companies and by the Metals Reserve Co. during the war, and numerous discussions with independent producers and representatives of the larger companies," according to an AEC document.

The schedule provides for payment of $1.50 per lb. of uranium oxide from the delivery of ores assaying 0.20%, plus a development allowance of 50c. per lb., plus allowance of 50c. per lb. as premium for 0.20% ore or better. Less will be paid for ores containing less than 0.20% uranium oxide. Ores containing less than 0.10% U_3O_8 are not considered under the schedule. At the same time, payment will also be made based on the vanadium oxide content of the ore, the basis being 31c. per pound for an amount not exceeding ten pounds for each pound of uranium oxide.

Where to Sell

The American Smelting and Refining Co. is operating the two "purchase" depots at Monticello and Durango for the Commission. Circulars describing the ore-buying program are available from AEC headquarters in Washington, D. C., from the branch office at Grand Junction, Colo., or from the Raw Materials Division, AEC, 70 Columbus Ave., New York, N. Y.

The AEC, or any competent

geologist, will tell you that minute quantities of uranium can be found almost anywhere. But there are few rock formations containing enough of the material to make it practical to work them.

In general, according to the "Prospectors Guide for Uranium-Thorium," published by the Bureau of Mines in Canada, "it may be said that any conspicuously heavy, black or dark-colored minerals discovered in a pegmatite should be tested." Such minerals may be difficult to distinguish visually from magnetite and ilmenite or the rarer tantalite-columbite, wolframite and cassiterite, according to the Canadian publication. The Geiger counter, however, will tell the difference instantly.

What Ores Are Like

Presence of a bright yellow or orange crust or powder surrounding a dark mineral is almost conclusive evidence that it contains uranium. Small plates or scales of a yellow or emerald green color on cracks and joints in a rock are a useful indicator of nearby primary uranium ore.

Color around uranium-thorium minerals in pink or red feldspar dikes is usually a conspicuously darker brick-red shade. In white dikes such minerals cause a brown or black discoloration in the surrounding rock. The guide adds that a conspicuous radial fracturing of the feldspar or quartz surrounding a mineral inclusion in pegmatite rock is also often a useful indication that the inclusion contains the two elements.

Pitchblende, known for years as the best radium ore, is the only uranium mineral known to occur in the form of definite veins or lodes. There have been isolated instances in which carnotite in a very pure form replaced a log or like objects, as demonstrated years ago when operators of the Sinbad Mine in Colorado found a whole log of carnotite worth about a quarter-of-a-million dollars.

The secondary uranium minerals, those formed in alteration by weathering or other natural reactions, are found throughout the country. Important deposits of these secondary minerals are usually found in hot or arid climate where glaciation has not removed much of the original surface rock. Vivid colors in shades of yellow, orange and green are the chief distinguishing features of such minerals. The most common mineral associations with uranium are cobalt, copper, silver and nickel.

Many of the uranium ores, particularly those of pegmatite type, contain thorium. Uraninite, the crystaline form of pitchblende that is found in pegmatites, often will have both. Straight thorium minerals of commercial value, in quantity, are much less common than the uranium minerals, however. Most of the few straight thorium minerals occur rarely and then in minute quantities. Up to the present, according to the Canadian guidebook, practically the entire world supply of thorium has been obtained from monazite.

The guide points out that it is doubtful if occurrences of monazite in rock would be of economic interest, but would be worthy of record and might be valuable in indicating presence of nearby placer deposits. Any extensive beach sand areas conspicuously rich in heavy black minerals are worth sampling for monazite, however.

For the prospector, the Geiger counter in portable form is the best bet in detecting the two radioactives. Although it will not pick up radioactive minerals more than three feet below the surface and shouldn't be trusted if the rocks are more than a foot down, it is a handy positive check for outcroppings and any rock samples. Little technical skill is needed, but practice is essential.

Using the Counter

Most counters come equipped with a dial, which registers the pulse of cosmic activity in the area, and earphones which transmit the cosmic pulse into sound. By checking the "background," or normal cosmic activity for the particular area, the prospector can see or hear the change which denotes increased cosmic disturbance. When a suspect rock sample is brought close to the tube end of the counter and the dial or tone beat increases materially, it is usually a good indication the rock is "hot." The counter is equipped with several power scales, so that the background can be ruled out for a really "hot rock's" potency test, or can be set low so that any slight radioactivity can be registered.

The counter can be put to work in old drill holes, in mines, caves and other underground structures.

A free assaying service (for uranium-thorium) is being carried on by the Raw Materials Division of AEC in New York. A representative 10-lb. sample from a claim should be sent to Raw Materials Division, Atomic Energy Commission, Post Office Box 30, Ansonia Station, New York 23, N. Y. Ores of the Colorado-Utah carnotite-type should be sent to the AEC at Grand Junction, Colo.

The sample is assayed and a report is mailed back to the sender. If the sample proves to show value, the Commission will request additional sampling. After these are tested and also show promise, the Commission may send representatives out to the location to look it over and start negotiations with the owner-operator.

Check Samples First

The importance of checking samples with a counter, whether in the field or at a base camp or nearby town, is demonstrated by the amount of "junk" the AEC assaying laboratory in New York receives daily. More than half the samples received have no radioactivity at all.

The counter indicates radioactivity. To break down the test to show whether the radioactive element is uranium or thorium there are several tests which can be applied. Positive test for uranium is its fluorescence under ultraviolet light, but here the reaction may be masked by other elements, thus most of the richer primary ores do not so react. By making the "bead" test, in which a finely ground rock sample is mixed with a little sodium or lithium fluoride, fused on a wire loop and inspected under ultraviolet light, the fluorescence test can be made to work.

Considerable source and guide material on the search for and detection of uranium-thorium is available. More is coming out daily. Handiest of the lot so far is the "Prospectors' Guide for Uranium and Thorium Minerals in Canada," published by the Bureau of Mines, Forests and Scientific Services Branch, Department of Mines and Resources, at Ottawa. Another, circular No. 13 of the Arizona Bureau of Mines, University of Arizona, contains a voluminous radioactive mineral identity chart.

The AEC, in cooperation with the U. S. Geological Survey, will publish a prospecting guide on "Occurrence and Identity of Uranium and Thorium Minerals" in the near future. It should be available at AEC Raw Materials Division headquarters in New York, or the U. S. G. S. offices in Washington.

ELBERN PIT, recently opened by Haley-Young Mining Co., as it appeared recently.

Self-Propelled Scrapers Find Use in Stripping on Mesabi

SELF-PROPELLED scrapers have been used since early May for stripping the newly-opened Elbern property of the Haley-Young Mining Co., near Chisholm, Minn., on the Mesabi Range. This is a new development in open-pit practice for the big iron range. The scrapers in this new service comprise four Wooldridge Terra Cobra "earth movers" of a rated struck capacity of 14 cu.yd. (17.5 cu.yd. heaped) and a maximum forward speed of 18 m.p.h. They are each powered with a 200-hp. Cummins diesel engine. Another mining company also is planning to use these machines, having purchased five of them for one of its properties near the west end of the range. The scraper may be said to be making its debut in the Iron Country.

The Elbern tract comprises 40 acres, three quarters of it underlain by about 40 ft. of direct-shipping non-bessemer ore, the tonnage of which is estimated at 600,000. It is a State reserve property which was leased to Haley-Young as a result of competitive bidding about a year ago. The company at the same time acquired the lease on another forty in the same area adjacent to the Oliver company's Fraser property.

Stripping work on the Elbern began May 10. The company wished to get the ore quickly, its program calling for shipments of 100,000 tons this season. Depth of overburden averages 80 ft. and the yardage to be moved was estimated at 1,500,000. The stripping ratio thus is 2.5 to 1. By removing 500,000 cu. yd. of overburden in an area about 2,500 ft. in circumference, the Haley-Young company estimated they could start producing early in August. The work progressed rapidly and over 400,000 cu.yd. of dirt had been stripped by the last week in July. The scrapers are stripping this portion to an average depth of 33 ft. The approach was sunk to 66 ft. depth and the scraper operations were branched off on 15-ft. levels.

Part of the ground carries boulders, to handle which a ¾-cu. yd., diesel-driven, full-revolving Lima shovel and six 15-ton rear-dump Euclid trucks have been provided. The trucks deliver to the same dump as the scrapers.

Mining will be conducted with a 3½-cu.yd. Lima diesel shovel, full-revolving and crawler-mounted.

Scrapers in Operation

Although the scrapers are self-loading, a single, powerful DH-19 Allis-Chalmers tractor speeds the operation by pushing. Another tractor is used on the dump and the road between.

Distance between loading point and dump averages approximately 850 ft., the maximum being 1,300 ft. The time required for loading a scraper, with the tractor assisting, is 25 to 30 sec. Four inches is the maximum depth of cut for the hydraulically-operated scraper blade. On the first level four loads are being moved every 15 min., it is estimated, three on the second level, and two and a half on the third. The average load is estimated at 11.5 cu.yd. Grades in pit and on dump are held to a maximum of 10%.

Men employed per shift in connection with the scraping operation number 11, two 8-hr. shifts being worked per 24 hr. Wages paid are higher than the union scale. On each shift the Cobra and tractor drivers also split a bonus depending on performance.

Fuel consumption for the four scrapers amounts to 50 gal. per 8-hr. shift. No. 2 oil is used, costing 17 to 18c. per gallon. The scrapers have required little maintenance, the wear being mostly on the cables and steering chains.

E. A. Young and D. D. Haley, both of whom are residents of Hibbing, are respectively president and secretary-treasurer of the Haley-Young company. Acknowledgment is due them for the information here presented.

THE SCRAPER on the right is digging its load, with assistance from tractor pushing behind. One tractor of the particular model and manufacture shown is sufficient for the task. The scraper seen on the left has already taken its load and is on its way to dump.

THE POWERFUL TRACTOR, having helped to load the scraper on the right (which is turning to go to the dump) is now dropping back to fall in behind the left-hand scraper to help it take its load. The grades in the pit are held to 10% maximum.

TWO SCRAPERS now await assistance in loading. A loaded scraper heads for dump.

SPREADING its load, the self-propelled scraper easily negotiates the rough surface of the dump.

KELLEY SHAFT, which figures in the Greater Butte Project, is within circle at left. Mines indicated are: 1, Anaconda. 2, St. Lawrence. 3, Mountain View. 4, Pennsylvania. 5, Rarus. 6, Berkeley. 7, Tramway. 8, Badger. Area to be mined by caving is right of center.

The Greater Butte Project

With its fully known reserve measuring up to 130,000,000 tons of mineable ore, the program assures a long period of activity for Anaconda's operations in Montana

E. S. McGLONE
Vice President
Anaconda Copper Mining Co.
Butte, Mont.

TO DISCUSS THE "Greater Butte Project" properly, it may be best to review the revolutionary periods that preceded it. Discovery of the vast ore deposits at Butte, which may still be regarded as one of the great metal resources of the country, had its beginning in the search for placer gold following the discoveries in California. On May 2, 1858, the first gold discovery in Montana was made in Gold Creek about 18 mi. northwest of Deer Lodge.

The news spread quickly and discoveries followed at other localities, including Silver Bow Creek, a few miles southwest of Butte. The latter operation lasted only three years. The prospectors then turned their attention to the bold outcrops of many veins on the hillsides above the placer diggings, and many lode locations were made. As tunnels were driven and small shafts sunk to shallow depths, it became apparent that the veins were valuable chiefly for silver. These contributed to making Montana the leading silver-producing state in the late 'eighties. The period of active silver mining continued until 1892, when a decline in price brought it to a close.

Meanwhile outcrops had been located in many parts of the district. The Anaconda claim was located in 1875, and in 1881 Marcus Daly, representing the newly organized Anaconda Silver Mining Co., exposed rich copper ore on the 300 level of the present Anaconda shaft. It was shipped to Swansea, Wales. From this beginning Butte became the greatest copper producing district in the world. Mining operations were conducted by various companies and individuals, each under its own management and following its own devices. The shafts sunk were relatively small because of the belief that Butte copper deposits were not deep-seated. Hoist-

Slightly condensed from a paper presented at Tenth Summer Convention of the Mining Association of Montana, Virginia City, Mont., July 31, 1948.

ing and mining equipment was likewise small. No one thought of preparing for large production from great depths.

As depth was gained, the veins of one company entered beneath the surface of its neighbor, giving rise to serious claims of ownership under the Apex Law. A period of intensive and costly litigation was finally terminated by the purchase of the Heinze interests which were eventually acquired by the Anaconda Copper Mining Co.

By 1910 Butte had produced 6,600,000,000 lb. of fine copper. There was no manganese production, and zinc production did not exceed 18,000,000 lb. Notwithstanding the magnitude of its operations, the district as a whole was being operated very inefficiently. There was no standardization of mining practice or equipment. There was much duplication of hoisting, draining and ventilating facilities. These uneconomic conditions, together with the continued threat of apex litigation, strongly recommended consolidation of the district. This was accomplished and resulted in unification under Anaconda ownership of the greater part of the producing district in 1910. This date may be regarded as the end of the first period in Butte's history.

Since that time much has been accomplished in the centralizing of operations and standardization of mining methods and equipment. Exceedingly important developments have been perfected in the metallurgical plants at Anaconda and Great Falls, including processes for production of electrolytic zinc and concentration of manganese ores.

During the second period of Butte's history from 1910 up to the initiation of the Greater Butte Project another 6,600,000,000 lb. of fine copper has been produced from Butte Hill together with more than 1,000,000,000 lb. of electrolytic zinc and in excess of 500,000 tons of manganese-oxide nodules. Production of copper from Butte was actually greater during the four years of World War II than during the four years of World War I.

Ore Mined Replaced by New

This is so because Butte has always been able to develop one ton of new ore for each ton mined and is still doing it successfully. In fact, recent development on the 4,200 level, the deepest in the district, is exposing high-grade copper-ore shoots aggregating over 2,000 ft. in length and containing the type of copper mineralization found at higher levels.

In addition, many improvements have been made in efficiency of mining methods. Efforts have been made towards minimizing the number of operating shafts and increasing their hoisting capacities. Common drainage levels and central pumping plants have been established. Ventilation and working conditions have been greatly improved. Size of mine cars has been increased from ¾-ton to 3-ton capacity. Hand-shoveling has been eliminated and replaced by mechanical loaders, scrapers and gravity methods. Stoping methods have been improved by development of the economical horizontal cut-and-fill procedure, and by modifications of the familiar square-set system. All these have marked a continuous increase in mining efficiency. Unfortunately, the hoisting shafts have remained about the same size because there was no way to enlarge them and continue the operations.

Scope of New Program

Further improvements along the line of greater tonnages must be made. After intensive study by the mining, geological, research and metallurgical departments, methods have now been developed for accomplishing this purpose. The new program has come to be known as the "Greater Butte Project." It calls for sinking one of the largest hoisting shafts in the country, with a cross-section of 9x38 ft. This will be of the most modern fireproof design and lined with concrete. Its cages will be large enough to hoist or lower a full-size underground locomotive. Fifty men may be handled on one deck. Its skips will hold 12 tons and be capable of hoisting 15,000 tons a day. The underground haulage system will be virtually an electric railroad handling 100-ton trains made up of 5-ton cars. The mining method has been completely determined, and has for its background the successful operations of the Anaconda company and other properties in the Southwest and in South America. It has already been tried and found applicable to the orebodies now to be mined. It again has for its object the handling of much larger tonnages than has been possible with present methods.

The orebodies involved in the Greater Butte Project are in the east portion of the hill between the Anaconda and Leonard shafts in the largest and most altered, multifractured granite area in the district. This ore occurs in two structural-type areas, namely: horsetail areas and wide-vein areas.

A Peculiar Structure

The horsetail areas are so named because of the resemblance to a horse's tail when the orebodies of this nature are reduced to a horizontal plane on a mine-level map. The principal ore in these areas occurs in numerous northwest-southeast striking veinlets with a stockwork of connecting stringers, irregular lenses and disseminations of copper-bearing sulphide. Chalcocite, enargite and lesser amounts of bornite are the principal ore minerals. The long horizontal dimension of these areas runs northeast and southwest, at right angles to the veinlets but the same as the strike of the principal veins which represent them near and at the surface. This peculiar type of structure is the result of mineral-bearing solutions having filled an area of minute fractures resulting from a movement of the granite along the long horizontal axis of the deposit. The largest orebody of this type is 100 to 400 ft. wide and 1,600 ft. long, and extends from 175 ft. above the 800-ft. level to below the 3,400, the lowest well-developed level. Past mining was confined to the individual high-grade horsetail ore streaks and concentrations of high-grade stringers and disseminations, leaving the intervening low-grade material and numerous closely spaced stopes filled with copper-bearing material once considered waste. The Greater Butte Project plans are to remove large volumes of these copper-bearing materials by large-scale, low-cost mining methods, and thus create a new, long-life addition to Butte operations.

The Wide-Vein Areas

The wide-vein areas of the Greater Butte Project are those where past stoping has been confined to relatively wide east-west-striking, closely spaced, parallel veins, between which connecting stringers, unprofitable to stope by presently used methods, are situated. These, with the intervening altered, mineralized granite, old stope filling, and small quantities of unmined regular reserves, constitute this type. Although narrower than the horsetail areas, the largest is 100 to 200 ft. wide, 1,100 ft. long and extends

from the 200 to the 1,200 level.

Viewed as a whole, the most important geological facts pertaining to the Greater Butte Project are the large dimensions of its various zones, the satisfactory copper content, and the fact that the altered, multi-fractured nature of the ore-bearing granite is particularly adapted to mining methods on a large tonnage, low-cost scale. However, another fact that must not be overlooked is that the geological data accumulated during the past 50 years made it possible to determine the existence of the orebodies involved in the project with a considerable degree of certainty and accuracy.

Huge Low-Grade Resources

As a matter of fact, it has taken many years of mining and development to expose a tonnage of this low-grade material sufficient to be considered as a long-time definite resource for large-scale daily production. This time has now arrived and a great low-grade ore reserve has been accurately delineated. Taking advantage of previous workings, new exploratory openings, totaling nearly 22,000 ft. of drifts and crosscuts on nine different horizons, have been driven in and through the various zones. The material excavated was carefully sampled and subjected to exhaustive laboratory tests. Upwards of 120,000 tons produced from this work have been treated in a 500-ton mill at Anaconda. The result is the assurance that there is at least 130,000,000 tons of this material available for mining by the proposed methods above the 3,400 level, which can be economically extracted and treated and will return 20 lb. of copper per ton, together with substantial precious metal credits. This is the equivalent of 2,600,000,000 new pounds of copper which may be confidently expected from the Greater Butte Project above the 3,400 level, all of which is additional to Butte's copper resources as measured in the light of present mining methods. It is also known that large tonnages of ore with similar grade and characteristics exist below the 3,400 level, but sufficient work has not yet been done to delimit these potential reserves.

Field work on the Greater Butte Project was initiated on Oct. 1, 1947, and is now progressing rapidly. Much preparatory work is necessary. In the first place it has been decided to fill all of the former openings, old gobs, and mined-out areas within the Project boundaries with wet mill tailings under pressure before the start of mining. It is estimated that some 9,000,000 tons of these tailings will be required and these will be shipped from Anaconda at the rate of 9,000 tons per day. The purpose of the filling is many fold. In the first place, it will remove any hazard from underground fires which have occurred in these abandoned areas in the past. It will also serve to cool the working places and improve the working conditions. At the same time it will serve to consolidate areas formerly filled with broken waste, thereby contributing to the safety of the operation. To this end, additions to the B. A. & P. trackage in the vicinity of the tailings ponds at Anaconda have been completed. At selected locations at Butte three slime plants have been completed or are under construction in the Project area. Tailings are being introduced at this time.

The surface in the vicinity of the new shaft has been cleared and actual sinking was started April 17. At present, sinking operations are suspended pending the completion of a temporary hoisting plant. The shaft has been appropriately named the "Kelley shaft" in honor of C. F. Kelley, chairman of the board of the Anaconda Copper Mining Co. Other phases of the preparatory work are in active progress.

It is estimated that the first Project ore will come in the third year at the rate of 5,000 tons a day. In the fourth year this will increase to 10,000 tons a day, and later to at least 15,000 tons when the Project is in full operation, prior to which a new service shaft will be required.

During the first five years preparatory costs, including capital expenditures, will exceed $20,000,000, of which more than half will be spent in the first two years.

At Anaconda the concentrating plant will be remodeled to enable it to treat the additional tonnage that the Project will provide.

Some Treatment Problems

The treatment of the Project ore for recovery of its copper, silver and gold presents some interesting problems, especially the ore from the upper levels which were originally mined 50 to 60 years ago. The old stopes contain gob and timber in all stages of decay which will be mined with virgin ore. The copper in the ore as mined occurs in the form of sulphides, oxides and soluble sulphate, all of which vary widely in amount.

Test work has been under way at Anaconda for several years, both laboratory and pilot plant. Flotation methods will be used and the problems lie in determining the best processes. Processes feasible both technically and economically have already been developed. Further work and study will deal mostly with details and determination of those methods which will give maximum economic results.

The Project ores will be treated at Anaconda. In general, the most modern milling methods will be used.

Lower level ore, which is not too oxidized, probably will be crushed, ground and floated directly in a conventional lime circuit.

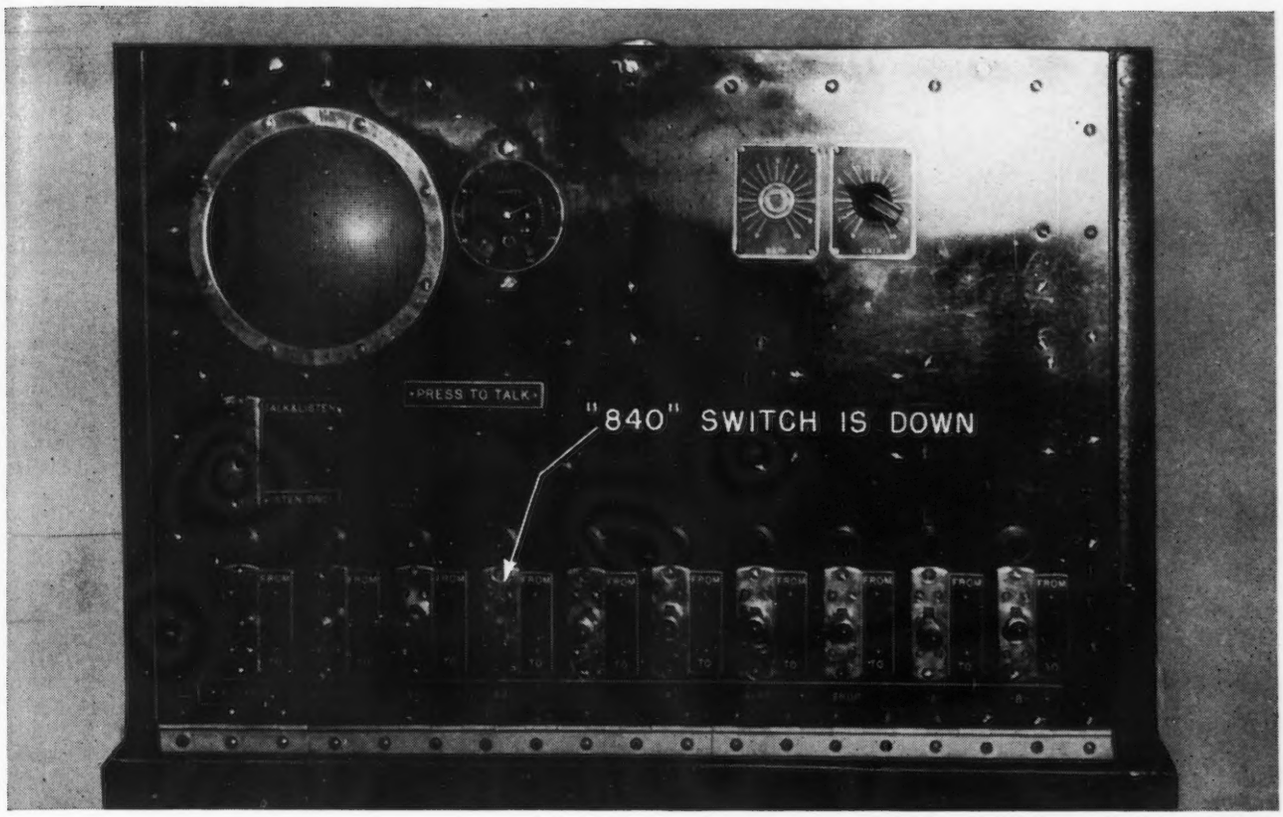
For upper level ore crushed to 1¾ in. size and containing sulphide, oxide and soluble copper, separation into two parts is contemplated.

The slime presents some nice problems. The slime pulp contains 5 to 25% of the copper in the original ore in solution as copper sulphate. In the solids are both sulphide and oxide copper. Several methods for treatment of the slimes have been developed and all are considered practical. Test work to improve recoveries is still in progress. Satisfactory treatment of the Project ore is assured.

Long Activity Assured

In the past, it has not been possible to give exact figures on the ore reserves of the Butte district because of the complex vein pattern and the impracticability of holding open the extensive underground workings not currently required. It is true that the ton-for-ton program is continuing successfully and the supply of known ore is always several years ahead of the rate of production, but a definite number of years of mining activity has not been assignable to vein-mining methods. But, however long that might be, the Greater Butte Project with its full known reserve accurately measured up to 130,000,000 tons of mineable ore assures by decades a longer period of activity for Anaconda's operations in Montana than it has been possible to state heretofore.

The ore produced from the Project will supplement the normal production of copper, zinc and manganese ore from the Butte district and thus increase the working forces at Butte, Anaconda and Great Falls substantially.



CONTROL PANEL for the communication system is located within easy reach of the hoistman. The microphone, upper left, also acts as a speaker. The "840" switch shown here is pushed down. This permits the hoistman to hear what is going on at that 840-level shaft station.

Electronic System Links Shaft and Surface Stations

C. M. MARQUARDT
Electronic Engineer
Combined Metals Reduction Co.
Salt Lake City, Utah

THE ELECTRONIC SHAFT communication system in use at the Caselton shaft of Combined Metals Reduction Co., Pioche, Nev., was developed and installed to increase safety and efficiency in hoisting operations and provide an additional channel of communication with the hoistman. As the lower workings of the Caselton shaft are very wet, installation of a factory-built communication system was impossible. Electronic equipment if placed underground would short out quickly and ordinary paper cone speakers would prove useless, for they, too, would soon be ruined by water or ruptured by a nearby blast.

In solving the problem, the following specifications had to be considered.

1. The system must provide communication facilities between the hoistman and each of the following points: (a) The main level stations namely, the 660, 840, 1,200, and 1,400; (b) skip loading stations; (c) shaft collar; (d) machine shop; and (e) the superintendent's office.

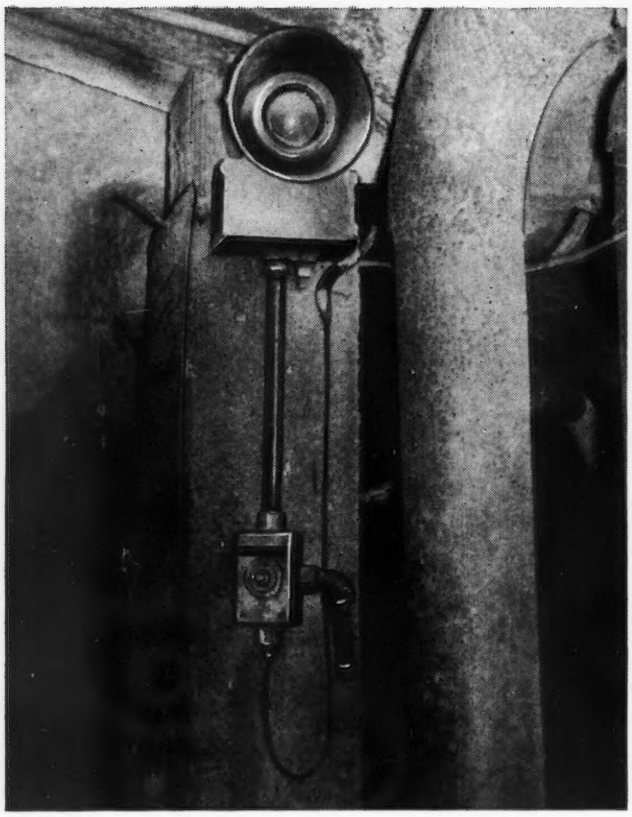
2. The hoistman must be able to listen to any one or number of different stations at will.

3. A person wishing to speak to the hoistman from a "dead" station must be able to notify the hoistman of his desire to speak without breaking into a channel in use. The possibility for any remote station to break into a conversation at will would result in a very hazardous condition. For example, the hoistman might mistake such a conversa- with that from the cager.

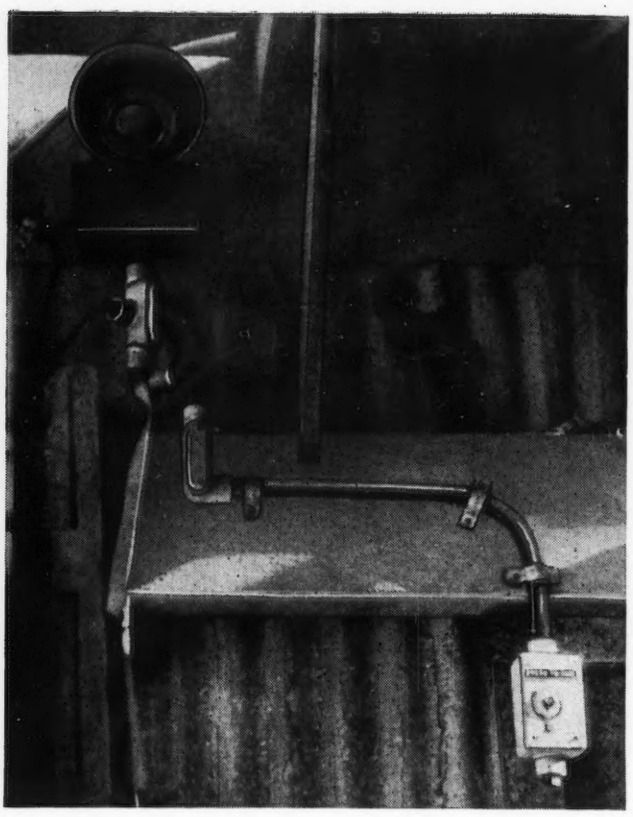
4. While not exactly essential, it would be desirable if remote stations could talk to one another directly. For example, the mine foreman may wish to talk directly to the cager.

5. As the installation would be a "press to talk" communication system, the moment one remote station had been given control of the apparatus, no other remote station or the hoistman should be able to take control of the system away from that party. Because the system was being installed as an aid in hoisting only, it was thought desirable that the hoistman be able to hear conversations going on between two remote stations, and facilities be given him to disconnect unauthorized conversations. There has been little difficulty from this type of conversation in actual practice.

6. As hoisting operations are car-



SPEAKER AT the 660 station. Note the tube at right of switch which contains silica jel to keep the circuit dry at that point.



"PRESS-TO-TALK" switch, lower right, enables employees to notify hoistman of desire to talk to him or to other parties.

ried on from only one level or skip pocket at a time, it was possible to connect all skip pocket speakers in parallel and on the same line.

7. Development of an electronic circuit simple to operate was important. Various change-overs must be made with simple switches and not with plug-in leads, as are used in conventional telephone switchboards, and in design the circuit had to be such as to keep the operation outwardly simple for the hoistman so he could master manipulation of the switches simply, accurately and quickly. Above all, the hoistman must not become a "telephone operator."

The System as Installed

As finally constructed and installed, the electronic communication system consists of the following units:

1. A 30-watt electronic amplifier. This high power was necessary because of poor acoustical conditions underground, and because reasonable power output was wanted when several stations were connected in on the surface. A volume control on the main panel permits the hoistman to adjust the volume level to suit conditions.

2. A main control panel at the hoistman's station houses the amplifier, speaker and pertinent auxiliaries.

3. Submergence-proof, fungus-proof and blast-proof permanent magnet speakers for each underground station. The type of speaker used was developed during the war for operation aboard naval vessels. The speakers employed in the Caselton system have a power handling capacity of 15 watts and act both as microphone and speaker. Volume control is concealed to prevent tampering.

4. A suitable cable assembly to connect the different speakers to the main panel. As the speakers were to act as microphones, the cable assembly must of necessity consist of shielded pairs. A plastite-covered, 5-pair cable with each pair shielded was obtained. The cable has very good moisture resistant qualities. A single pair of shielded leads is brought into the speaker at each station in the system. By an electronic switching system this pair of cables carries the conversation in both directions, and also serves as a means for signaling the hoistman when the station wishes to establish contact with him. At each speaker is a push button switch marked "Press to Talk."

When the system is in operation, the hoistman follows the cager wherever he goes. For instance, if the cager is on the surface, the hoistman just flips the switch marked "Collar" on the main control panel downward to the "To" position. He then can hear all conversations from the collar speaker, which now acts as a microphone. All other switches are in the center or open position, consequently he hears conversations only from the collar of the shaft. If the hoistman wishes to talk to the cager, he presses his "Press to Talk" switch and then talks into the speaker on the main control panel. The cager, in turn, need not press the "Press to Talk" button to reply to the hoistman.

For example, let us assume that the cager wishes to go to the 1,200 level. He will either signal the hoistman in the conventional manner or give hoisting instruction verbally to the hoistman over the electronic communication system. In the latter event, the hoistman repeats the signal over the communication system back to the cager to avoid any misunderstanding of the hoisting signal. As soon

as the cager has left the shaft collar for the 1,200 level, the hoistman disconnects the collar speaker and connects the 1,200 station speaker by flipping its switch downward or to the "To" position. He can now hear from the 1,200 station and can establish contact with the cager as soon as he lands. If, after looking over the broken rock loading situation on the 1,200 level, the cager proceeds to the 1,200 pocket, the hoistman disconnects the 1,200 station and connects the switch marked "Pockets" to the "To" position. This enables him to hear all sounds emanating from the different pocket stations. As there is activity only in the 1,200 pocket, the hoistman is in constant communication with the cager, and if he wishes to talk to him he needs merely to press his "Press to Talk" switch. The cager's activities are all heard by the hoistman, and if the cager experiences any difficulty such as occasionally happens when very wet material overfills the measuring pocket after a hang-up, he calls for the second skip and fills both skips, thereby preventing serious spillage into the shaft.

Ore hoisting in the Caselton shaft is done on bell signals. Since installation of the system, savings in overall hoisting time have been made. Because the hoistman can now hear the ore dump into the skip, the set brakes on the hoist can be released by the hoistman immediately after the skip has been filled, and hoisting can start the moment the bell signal is received.

Foreman Instructs Cager

If the mine foreman should find that operations are being impeded on the 660 level because of full loading pockets, he presses the "Press to Talk" button on the 660 speaker, causing a bell to ring and a pilot light over the 660 switch on the main panel to light for the period the button is depressed. The hoistman disconnects the "pockets" and connects the switch for the 660 station in downward or "To" position and asks this station for orders. The mine foreman may only ask the hoistman to tell the cager to start hoisting from the 660 level, or he may wish to speak to the cager directly. If latter is the case, he asks the hoistman to connect him with the cager. The hoistman now flips the switch associated with the 660 speaker to the upward or "From" position and flips the "pocket" in the "To" position. The mine foreman, after pressing his "Press to Talk" switch, can talk to the cager at the 1,200 pocket station, with the hoistman hearing both conversations. To hear the cager's reply, the mine foreman releases his "Press to Talk" switch. The mine foreman on the 660 level has thus remotely taken control of the system away from everyone else and he will remain in control so long as the hoistman leaves the station selector switch associated with the 660 level in the "From" or upward position.

Furthermore, no other station can get control away from the hoistman. For example, if the cager should become confused and press his "Press to Talk" switch while the mine foreman had the one on the 660 level depressed, nothing would happen. The mine foreman would remain in control of the system. This would also be the case if still another station in the system pressed its "Press to Talk" switch. However, for each depressed button there will be lit a pilot light on the main control panel. In this manner, any station can talk to any other station, or group of stations, but the station with the switch in "From" position that has control of the amplifier.

System Is Fool-proof

The system is as near fool proof as possible. The hoistman can learn to operate it in half a shift. The foreman, shifters and cagers have been taught how to operate the switches at the speakers. At times, miners will wish to call the cager in case of illness or injury, and as often as not will keep the switch button depressed while they are talking to the hoistman. However, the miners cannot take control of the apparatus from the hoistman. Upon receiving their initial signal, he depresses the switch associated with the station from which the miner is calling in "To" position. The hoistman usually will tell the inexperienced operator that it is not necessary to depress the button on the speaker once he has established contact with the hoistman. Such messages usually are relayed by the hoistman to the cager or superintendent's office or shop. On one occasion an injured man was removed from the 660 level within three minutes, although the cager was loading ore from the 1,200 pocket. It should be mentioned that the 1,200 pocket is so wet that all attempts to maintain a telephone have been unsuccessful. The speaker in this pocket once also shorted out but is now kept dry internally by a tube of silica jel connected to it.

An interesting feature is the speaker in the superintendent's office. While the entire system must be such that the hoistman can connect any station in the system in an instant, such was not desirable in the case of the superintendent's speaker. Consequently, a sound-powered relay was associated with this speaker. Before the hoistman or any other station can listen to the superintendent's office, prior conversation is necessary. Once the sound-powered relay has been actuated it will remain so for normal conversation the same as any other station. A pilot light on the speaker warns the superintendent that the sound-powered relay has been actuated and he can de-actuate it by merely pressing a button.

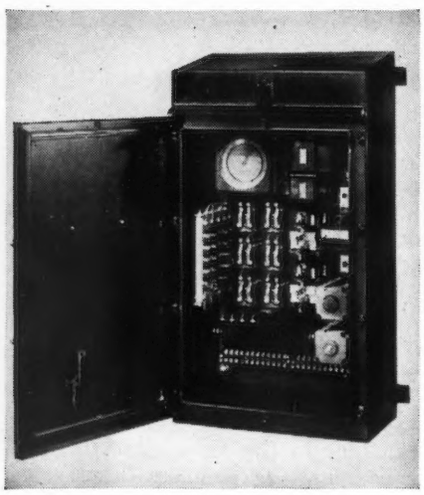
The electronic system, which allows conversation and switching over the same pair of wires, is a simple electronic switch employing one tube per station. The pair of wires leading to each station is kept charged to a negative voltage of about 30 v. This voltage is taken directly from the bias voltage supply of the amplifier. The negative voltage keeps the grid of a vacuum tube biased to cut-off so no current can flow in the plate circuit of the tube which is connected in series with the coil of a suitable relay. When a "Press to Talk" switch at a particular station is depressed, this negative voltage is shorted out, but a 5-million ohm resistance in series with the bias and supply voltage prevents any appreciable current from being drawn. The grid bias voltage is thus reduced to zero and the relay is actuated, causing the pilot light and signal bell to operate.

Insulation Important

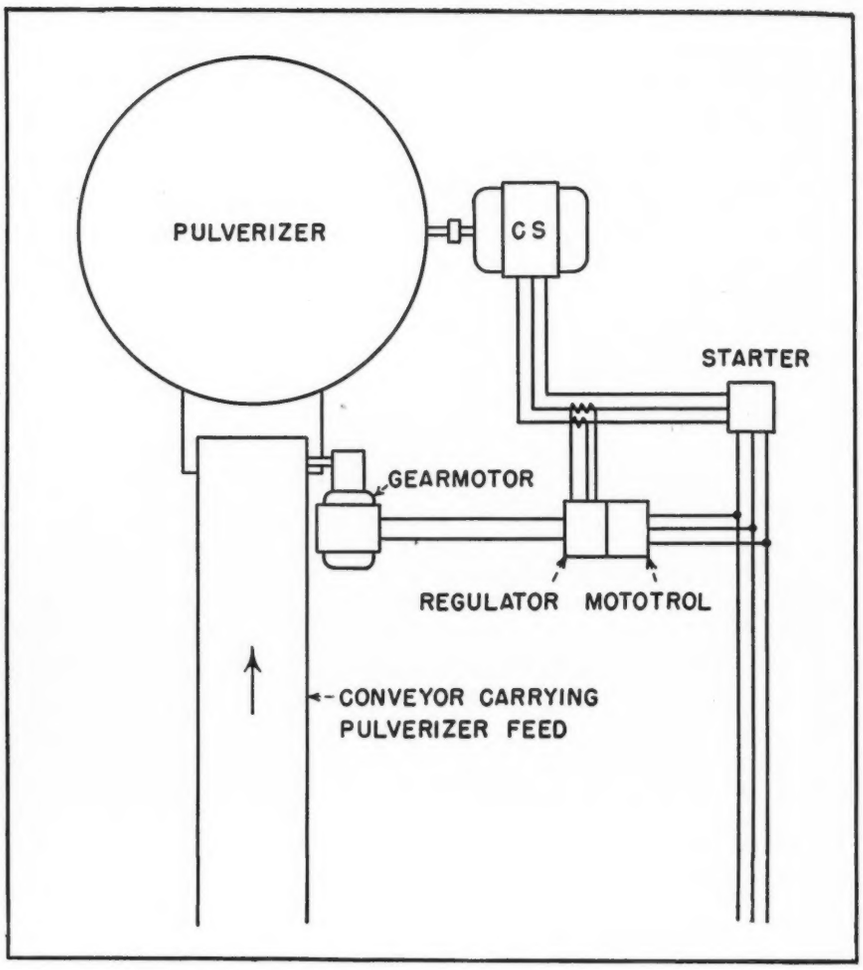
With this electronic switching device the cables connecting the speakers to the main control panel must have good insulation. It is interesting to note that the outside jacket of the cable in the shaft has been cut at a point between the 1,200 and 1,400 levels, and while a steady drip of water has been issuing from the 1,400-level end of the cable for several months, there has been no interruption in service due to loss of insulation. Thus, while water drips from the inside of the cable, the insulation still remains in excess of 5 megohms, or the various electronic switches would be actuated. The cable consisting of 5 pairs is ½ in. in diameter.

Automatic Control of Pulverizers

PHELAN McSHANE
Westinghouse Electric Corporation
East Pittsburgh, Pa.



THIS SIMPLE electrical control . . .



. . . varies crusher feed rate according to load on drive motor or . . .

By automatically adjusting the feed rate to suit particle size and hardness, this device increases tons crushed or ground by ordinary ball mill or crusher equipment

TO OBTAIN MAXIMUM production, as well as a uniformly ground product from a pulverizer, it is necessary to regulate closely the rate at which material is fed to it.

If all of the material fed to the pulverizer were of uniform size and hardness, the feed rate could be constant, and maximum production be obtained. Unfortunately the particle size and friability of the feed are rarely uniform. It is evident that if size and hardness vary, best results would be obtained by varying the rate at which material is fed to the pulverizer.

Size Affects Power

Experience has demonstrated that when the size of the material increases, the power required to drive the pulverizer increases. Conversely, if the size decreases, the power required decreases. This being the case, the rate at which material is fed to the pulverizer must be limited, if not automatically controlled, to a value that will not overload the pulverizer when the pieces are larger. Obviously, production is lost when smaller pieces constitute the feed and the rate is constant.

Experience has also demonstrated that a change in the hardness, as well as size, affects the amount of material that the pulverizer will properly process, and that if a constant rate of feed is employed, it must be limited to a value that will not clog or overload the pulverizer. It is also evident that a change in friability or hardness of the material will cause a change in power required to drive the pulverizer.

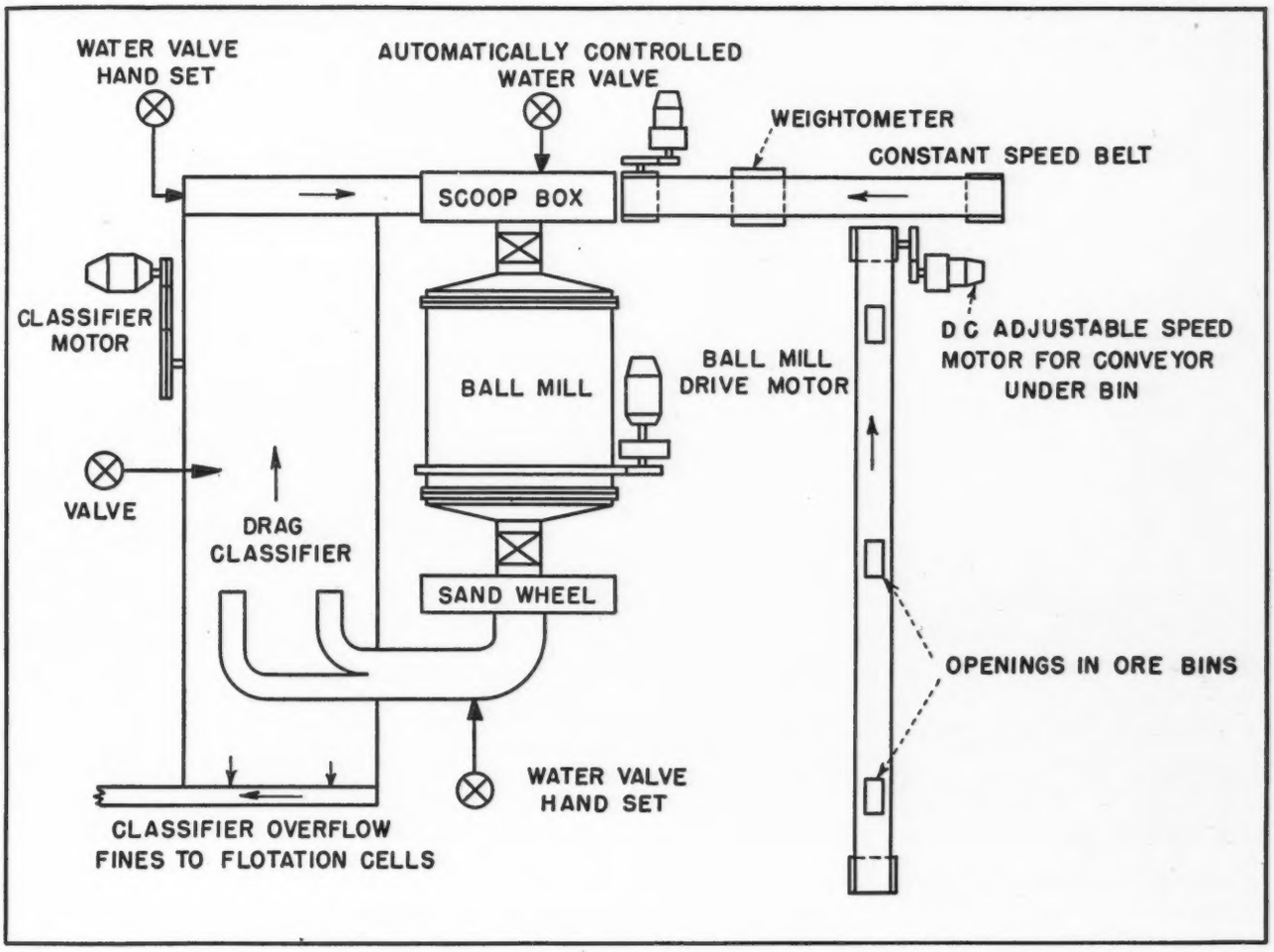
The foregoing indicates that the variation in the size, hardness and the amount of material fed to the pulverizer will cause a change in power requirements to drive it. It also indicates that if the rate of feed were varied to suit varying conditions, the load on the pulverizer motor could be kept constant and maximum production obtained.

Drive Motor Governs

As the load on the pulverizer motor does change in agreement with variations in hardness, size, and the quantity of the material fed to the pulverizer, the load on the motor driving the pulverizer can be used to supply the intelligence needed for automatic regulation of the feed rate.

To increase production, devices are available that are responsive to the load on the pulverizer motors and that will cause the pulverizer feed rate to be automatically varied. Thus, the load on the motor is kept essentially constant and maximum output results.

To obtain automatic feed control, current transformers are placed in



. . . varies ball mill feed according to load on classifier. Output increases in both cases.

series with the power leads to the pulverizer driving motor as shown in the leading illustration. The secondary leads of the current transformers are connected to a load responsive relay. The contacts of this relay open when the load on the motor is less than a pre-selected amount, and close when the selected amount is exceeded.

The action of the relay is to cause the speed of the feeding device, such as a belt conveyor or other type feeder, to be increased or decreased incrementally at selected time intervals. The length of time or intervals between increment or decrement in the rate of feed is selected by an adjustable time relay.

Variable Speed Needed

It is apparent that if the rate of feed is varied even slightly, a definite period of time, even though it be short, will elapse before a change in load on the pulverizer motor will occur. This explains why changes in the rate of feed are made incrementally and at regularly spaced time intervals.

If the rate of feed is to be regulated, it is of course necessary that the feeding device be driven by an adjustable-speed motor and that the means used to adjust its speed be responsive to the load responsive relay mentioned above. When direct current is available, a standard shunt wound d.c. motor, the speed of which can be controlled by a motor-operated field rheostat, is employed. If direct current is not available, the feeding device may be driven by a d.c. motor powered and controlled by Mototrol electronic adjustable-speed drive, taking standard d.c. power.

Grinding Circuit Control

Wound rotor induction motors are not suitable for driving the feeding device because their speed will vary with load impressed on them, which of course is undesirable for this application.

All of the apparatus employed to regulate the feed is commonly used in industrial plants. It is a simple and inexpensive combination and it can increase production.

With certain modifications, principally the use of a relay that provides longer time intervals between changes in rate of feed, this type of automatic control has been successfully used to control the rate of feed to ball mills. When applied to ball mills, the intelligence that calls for a change in the rate of feed comes from the motor that drives the classifier rather than from the ball mill motor.

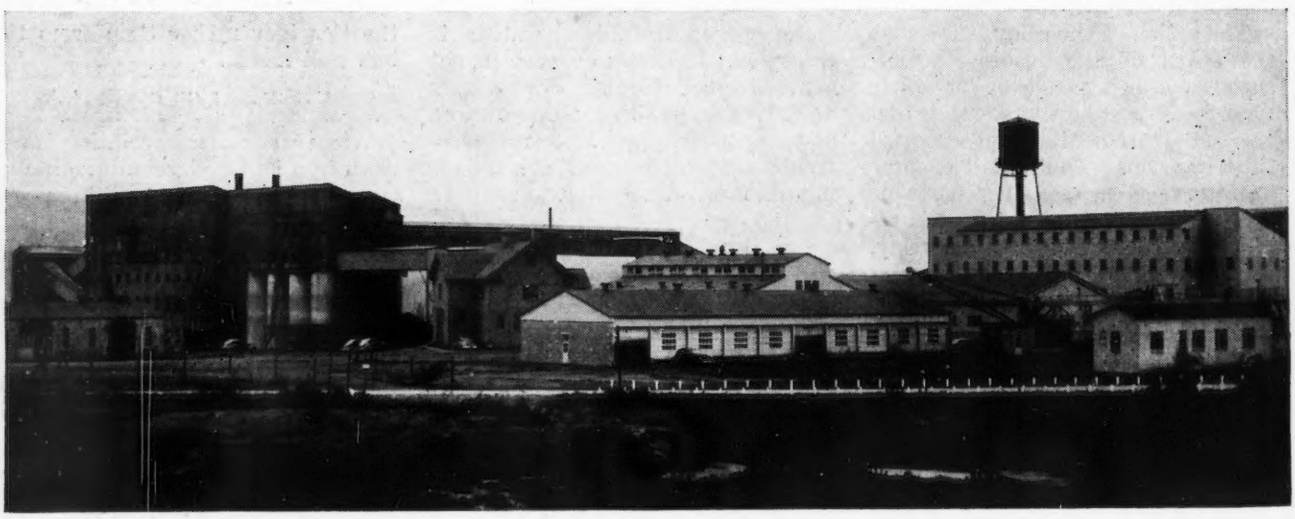
Feeding Mill Properly

When automatic regulation is applied to a ball mill grinding circuit, the aim is to feed the mill the proper amount of material to permit it to grind the material that enters it fine enough to meet requirements. The best evidence that the mill is, or is not, doing this is reliably reflected in the load that drives the classifier, not the load on the ball mill. In fact, the load on the ball mill motor gives no indication that the material leaving it is properly ground, beyond the fact that a dropping load on the motor often indicates an undesirable change in feed.

1 OPEN-CUT MINE near Star Lake, N. Y., is the largest in this hemisphere producing magnetite. The ore, broken by blasting churn-drill holes (see front cover), is loaded by shovels into trucks and taken to crushing plant. From latter . . . .

Adirondack Iron Ore

Expanding operations and large reserves at Benson Mines, in northern New York, promise that here J. & L. will have an important source of supply of iron ore within the next decade



3 AT THE SEPARATING PLANT, seen here at the right, a pilot plant is being added that will try out various procedures for recovering this martite. The sintering plant is at the left. As for the magnetite, it is recovered with the aid of . . . .

2 CONVEYORS carry ore to separating plant where magnetite is concentrated. Some iron mineral, called martite, is not magnetic enough to permit desired recovery, with the result that .... (See Photograph 3 on opposite page.)

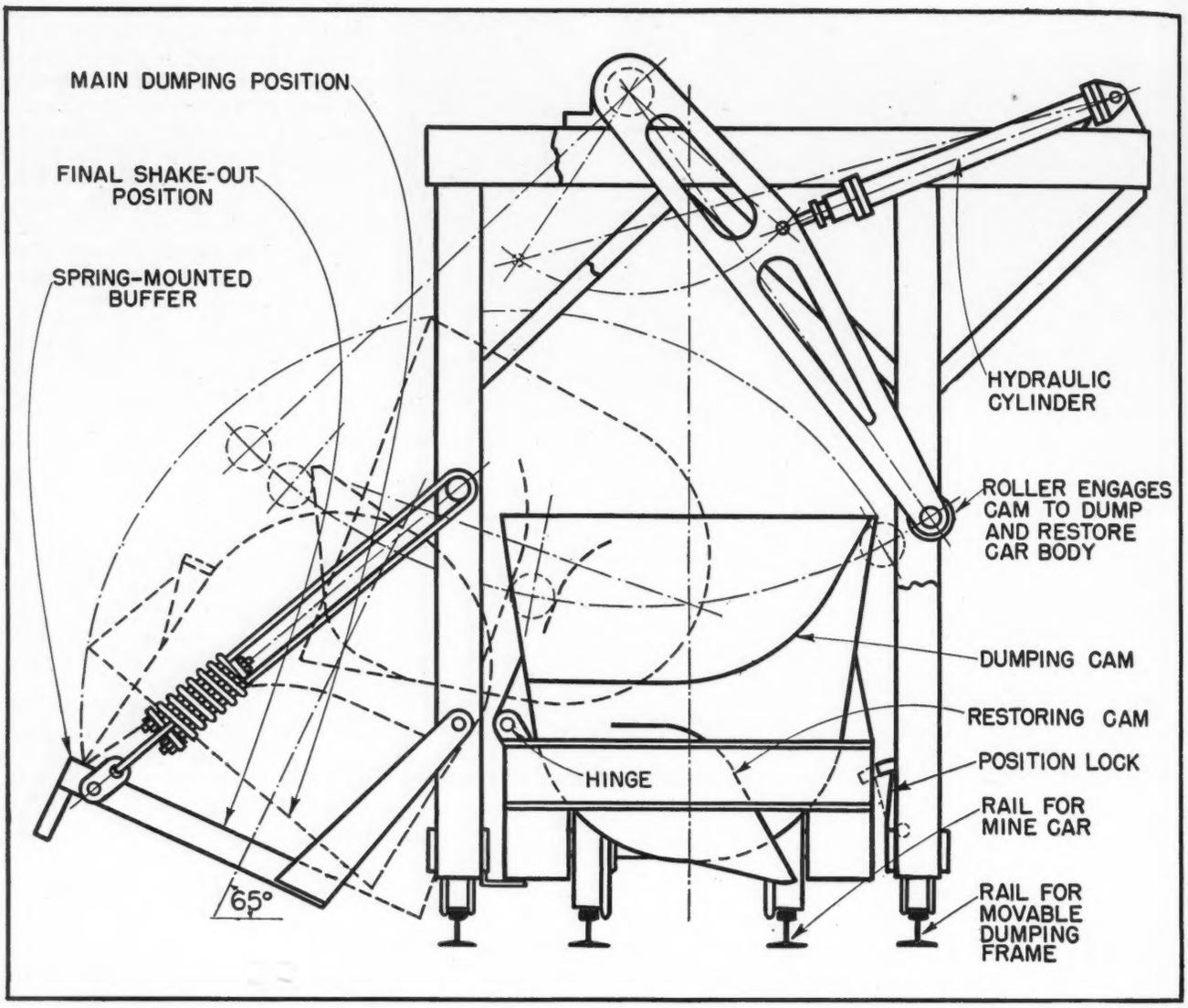
THE DEVELOPMENT of Benson Mines, at Star Lake, N. Y., is the result of a search begun by geologists of the Jones & Laughlin Ore Co. nearly 10 years ago. Foreseeing the need for additional reserves, they began investigating the possibilities offered by the magnetite deposits of the Adirondack region in northern New York. Eventually they came to the old pit and plant on the Benson property that had been idle for 20 years and were practically ruins. Here their exploration for ore was fruitful. The land was leased in 1941. Then World War II engulfed this country, and in the fall of 1942 the Defense Plant Corp. began building the plant now standing at Benson Mines as part of the Government's production program. Four years later, the war being over, Jones & Laughlin bought the plant. At the present time a pilot plant is being constructed for crushing and concentrating the non-magnetic ore, or martite, that occurs with the magnetite.

Last year the plant turned out over 650,000 tons of high-grade concentrate. Output in 1948 is expected to reach 800,000 gross tons. This figure will be exceeded, if current studies are successful.

for Jones & Laughlin

4 WET-BELT MAGNETIC SEPARATORS in separating plant, here seen from above. Only the upper part of each belt appears, separation being effected on the machine below where magnetite is drawn to the belt as it passes under magnets of reversing polarity, whereby particles of included gangue are dropped. Iron concentrate thus made is too fine for the furnaces and goes to ....

5 THE SINTERING PLANT (the exterior is shown at the left of Photograph 3). Here sintering is done on a pallet-type machine. The sinter discharge from the pallets is screened, as customary, to remove the fines and is shipped direct by rail to the Jones & Laughlin blast furnaces at Pittsburgh and Aliquippa, Pa., and Cleveland, Ohio.



MOBILE DUMPING frame is mounted on wide rails. Hydraulic piston operates system of levers which cause roller to engage cams on ends of cars. Car body is rolled over, dumped and restored. Spring-mounted buffer frame shakes out car.

New "Roll-Over" Car Dump

A NEW "ROLL-OVER" mine car and automatic dump mechanism has been evolved by R. W. Neyman, superintendent, Hecla Mining Co., Burke, Idaho. Both have been in operation successfully in the Star mine for more than a year. A patent has been applied for, and Mr. Neyman recently turned the manufacturing rights over to Coeur d'Alene Hardware & Foundry Co., Wallace, Idaho.

The assembly is designed for fast main tunnel haulage, and principal advantage of the "Roll-Over" side-dump car is its ability to handle wet and sticky materials. The car has a low center of gravity and is equipped with Timken roller bearings, spring-mounted truck, and draft buffers. Attached to each end of the car body are simple cam members designed to be engaged by the rollers of the dump mechanism —a distinctive feature of the Roll-Over system. The manner in which cars are dumped is shown in the accompanying diagram. In the Star mine installation, where one-position dumping only is required, the frame is mounted on fixed concrete footings, and pneumatic cylinders are employed for dumping the car under it. The cylinders are actuated by compressed air. For installations in which dumping is to be done in several successive positions, as into a series of bins, the dumping frame is mounted on a wide-gage track after the manner of a gantry crane. Rail grips are provided for holding the frame in any desired position along the car track proper. Dumping of cars is done by hydraulic cylinders served from a self-contained, compact, high-pressure oil pump unit with accumulators installed on the frame.

How Unit Operates

Steps in the dumping procedure are as follows: As the train drives slowly into the dumping area, the motorman sets either the limit switch (situated alongside the car traveling locus) or the electric eye, whichever may be used, into the position of "readiness to act." Then, as the first car comes into exact

STATIONARY DUMPING unit is operated with compressed air cylinder. Note arrangement of cams on end of "roll-over" dump car.

ROLLER OF DUMPING unit is engaging restoring cam which brings round-bottom car body back to normal position on chassis.

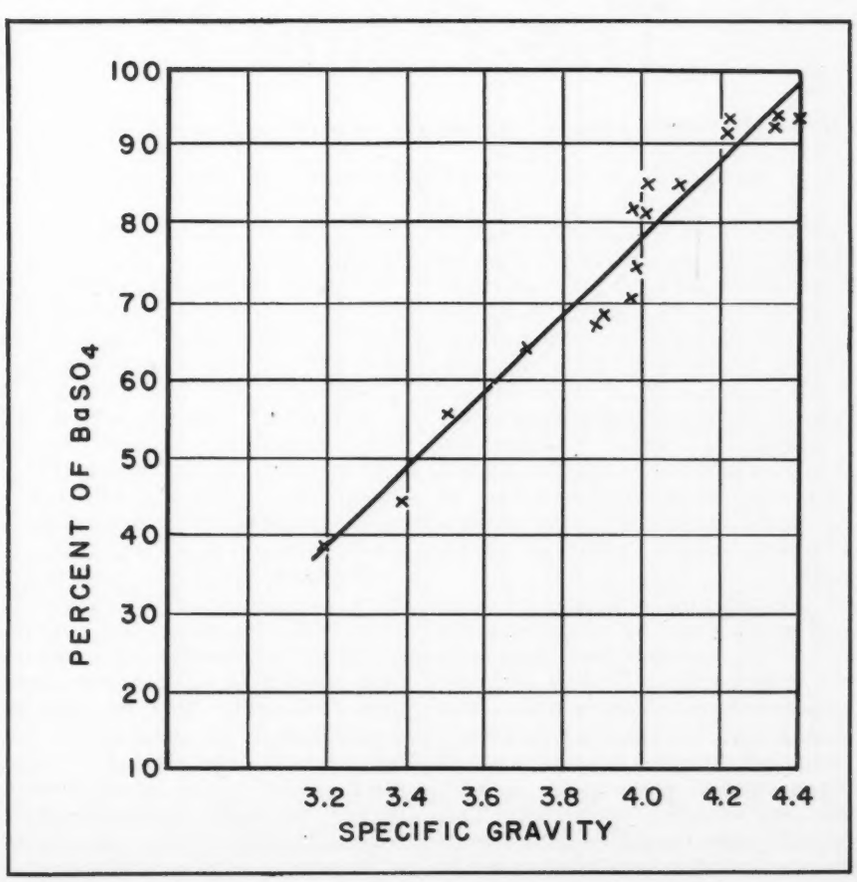
dumping position, the limit switch or electric eye initiates the action which results in engagement of car-position lock, thereby securing the car frame against upward as well as endwise movement. Next, the motorman pulls the cords extending overhead for a distance equal to maximum train length beyond the last dumping position. This, in turn, starts the cycle by which the two hydraulic cylinders dump and restore the car body. As soon as the car body is restored to normal position, the position lock is automatically disengaged, and a pilot light indicates this condition to the motorman. An interlock is provided whereby the dumping operation cannot start until the car position lock is fully engaged. Readiness for dumping is indicated by a pilot light. A spring-mounted buffer frame is included in the design as a necessary striking member for the car body in its extreme dumped position.

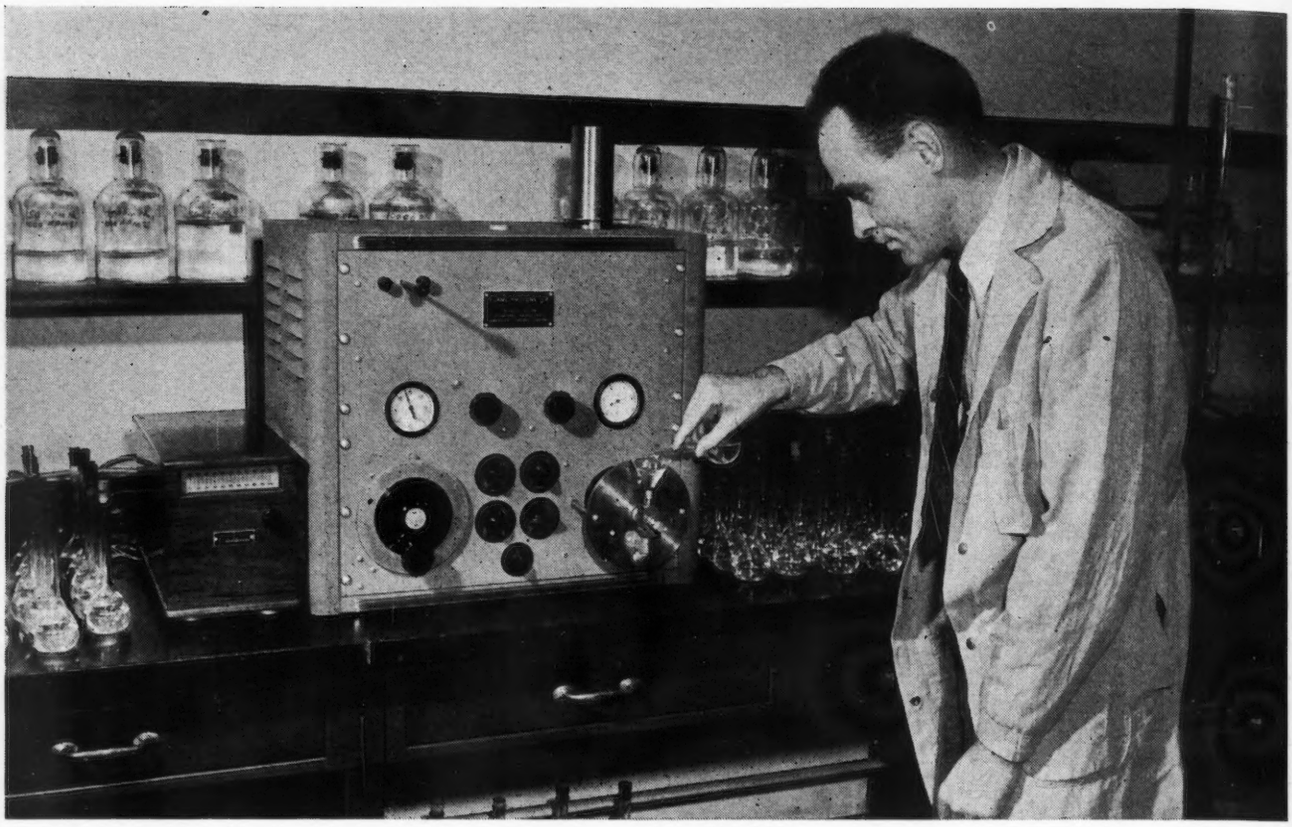
Specific Gravity and Assay Relationship of Arkansas Barite

IN REPORTING the commercial value of prospective deposits of barite in the Arkansas field, according to W. F. Boericke, consulting engineer, New York, it is customary for local engineers to give the specific gravity of the barite material rather than the percentage of barium sulphate. The same custom is followed by mill operators in reporting grade of finished product.

As Arkansas barite contains only novaculite or quartz as impurities, with usually less than 1% of iron oxide, specific gravity varies almost directly with percentage of $BaSO_4$. The one serves as an approximate index of the other.

Mr. Boericke has found the accompanying graph useful for converting quickly from specific gravity to percent of barium sulphate, or vice versa. Inasmuch as Bureau of Mines reports use the $BaSO_4$ content only in reporting logs of drill holes, while local engineers refer to gravity, a little confusion may exist unless this relationship is visualized. The graph was drawn by plotting assays against specific gravities of the same samples.





ANALYTICAL PROCEDURE with this new instrument, the flame photometer, consists of pouring the sample from a volumetric flask into a funnel. Result is indicated on galvanometer at left in parts per million. Atomized sample is blown into gas flame, intensity of resulting flame color is registered by photometer and gives a measure of metal content of sample.

The Flame Photometer

R. BOWLING BARNES, JOHN W. BERRY, and WILBUR B. HILL
Stamford Research Laboratories, American Cyanamid Company

IN CONTINUOUS large-scale operations, such as most ore-dressing plants, the ordinary "post-mortem" control assay, by which the operator learns today how he did yesterday, falls far short of the ideal control method. What is needed, of course, is an instantaneous assay method that would continuously measure and record analyses of mill pulps, so the operator could see at a glance exactly what is, at that moment, actually going on in his mill.

Instrumental analysis, as such automatic assaying methods might be called, has developed immensely in recent years. Devices such as: spectrometers, polarographs, turbidimeters, microscopes and various electronic instruments have all been applied successfully to continuous analytical technique. This article presents one such new technique: use of a flame photometer in analyzing certain ores and metallurgical products.

The flame photometer utilizes the well-known fact that many elements emit a characteristic light when placed in a flame. The yellow color of sodium (the sodium D lines) is most familiar. The intensity of the light emitted is a measure of the concentration of the element producing the light, and the whole technique of spectrochemical analysis is based on this fact.

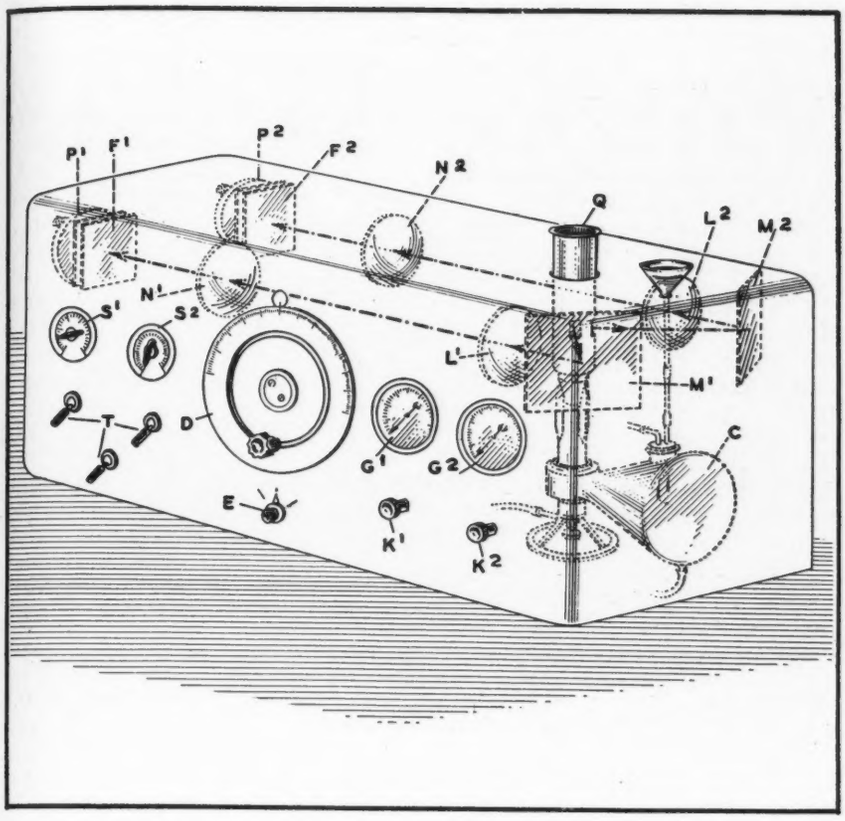
The flame photometer used in our work was simplified in comparison with older spectrometric instruments in that it uses a low-temperature flame. A high-temperature flame will excite light emission in a wide variety of metal atoms, but for the sake of developing the simplest possible piece of equipment, we have retained a low-temperature flame. The field of this instrument is therefore quite severely limited, although higher temperature instruments are now being developed.

The flame photometer is pictured and described in the accompanying photograph and drawing. Equipped as shown, the instrument makes possible the rapid and accurate analysis of solutions for their content of sodium, potassium, lithium, and, in certain cases, calcium. The instrument has been described in detail in two recent papers.[1,2]

Because of the wide wave-length separation of their characteristic atomic line spectra, sodium and potassium are readily determined in practically any sample that can be put into solution. Calcium, however, emits an orange colored band spread over a rather broad range of wave lengths. This emission arises not only from the calcium atoms but from calcium-containing molecules. The much stronger sodium emission falls in the same

[1]Barnes, R. B.; Richardson, David; Berry, J. W.; and Hood, R. L.; Ind. Eng. Chem., Anal. Ed., *17*, 605-611 (1945).

[2]Berry, J. W., Chappell, D. G., and Barnes, R. B., Ibid *18*, 19-24 (1946).



ESSENTIAL ELEMENTS include: C, atomizing chamber; Q, chimney around flame; G-1, G-2, gas and air gages; M-1, M-2, mirrors; P-1, P-2, photocells; L-1, L-2, and N-1, N-2, Fresnel lenses; F-1, sodium or potassium filter; F-2, lithium filter.

general region as the calcium bands, and the filters for absorbing sodium light are not perfect. Hence, accuracy in determining calcium in samples high in sodium is not good, but in the absence of sodium, results for calcium are satisfactory.

The flame photometer now used is referred to as the "internal standard" instrument. The term refers to the means of correcting for errors caused by the presence of foreign ions, for example, sulphuric acid, 1% of which could throw a sodium analysis off by 15%. The sample to be analyzed and all standardizing solutions are made up to contain a fixed amount of lithium. The instrument contains two optical paths—one for lithium and one for sodium, potassium or calcium. By a suitable potentiometric circuit, the ratio of light striking the lithium photocell and that striking the other is determined. A calibration curve for the series of known standardizing samples has been prepared. Because the effect of outside agents, such as the sulphuric acid referred to, is about the same on the lithium as it is on the element being determined, the light ratio remains essentially unaffected by the acid and a higher degree of accuracy results. The diagram shows a comparison of effect of sulphuric acid on sodium determinations by the internal standard method and the older "absolute," or uncorrected method.

Comparison of Chemical and Photometric Results on Silicious Rocks

	Flame Photometer			Chemical		
CLAYS	% Na_2O	% K_2O	% Total	% Na_2O	% K_2O	% Total
1	0.55	0.48	1.03			0.7
2	0.35	1.20	1.55			1.40
3	0.57	1.45	2.02			1.90
4	0.63	2.77	3.40			3.20
5	0.42	4.34	4.76			4.40
REFRACTORY ORE						
1	5.14	8.67	13.81			14.14
FELDSPAR						
1*	2.50	12.70	15.20	2.38	12.58	14.96
2	2.87	12.02	14.89	3.04	11.30	14.34
ALKALI GLASS						
1	12.72	0.40	13.12	12.30	0.45	12.75

*Bureau of Standards No. 70.

Analysis of Potash Ores

Using the flame photometer, determinations of sodium and potassium content of potash ores can be made in relatively short time. Accuracy is in most cases quite sufficient to guide and control any refining to which the mineral is subjected.

Earlier work with the absolute instrument required that corrective

Comparison of Chemical and Flame Photometer Assay of Calcium in Magnesite Ore

Sample No.	Chemical Analysis MgO	Chemical Analysis CaO	Photometric CaO
1	26.7	19.07	19.32
2	40.00	6.36	6.07
3	38.1	7.62	7.43
4	34.8	11.25	11.48
5	40.7	4.73	5.10
6	41.6	4.08	4.00
Bur. Stds. No. 104		3.23	3.43

Determination of Potassium Chloride in Sylvinite Ores by Internal Standard Flame Photometer

Samples	Chemical* % KCl	Flame Photometer % KCl
No. 1 (Cleaner concentrate)	97.5	97.6
No. 2 (1st Cleaner Tail)	23.5	21.3
No. 3 (2nd Cleaner Tail)	73.4	72.6
No. 4 (Rougher Tail)	3.21	2.36
No. 5 (Primary Slime)	14.54	11.7
No. 6 (Secondary Slime)	19.37	16.37
No. 7 (Composite)	76.14	73.5
No. 8 (Composite)	9.45	9.45

*Obtained by "regular" platinate method.

factors be applied to the results. The difficulty was caused by interference of one element when analyzing for the other. It was necessary to determine sodium chloride content and percent of insoluble matter first, then subtract these from 100 to get the potassium chloride content.

With the improved internal standard instrument, however, both sodium and potassium may be determined directly and without applying corrections. An accompanying table shows a comparison of analyses made on sylvinite products by the photometer and by chemical methods.

Analysis of Clays, Feldspars

Determination of oxides and sodium and potassium in clays, feldspars, or other rocks is difficult and time-consuming when standard chemical methods are used. With the photometer, such analyses are a matter of minutes. The procedure is as follows:

About one gram of sample is taken into solution, in platinum, with perchloric and hydrofluoric acids. After evaporating to near dryness, a few drops of hydrochloric acid are added to the residue, and the solution is then diluted with distilled water to 50 cc. in a volumetric flask. Appropriate aliquots for sodium and potassium are removed, a standard amount of lithium is added as an internal standard and samples are brought to proper concentration by further dilution. The analysis is then made as outlined in the caption for the diagram of the instrument. Table II gives comparative results of this method.

Calcium in Magnesite

Although determination of calcium with the flame photometer does not present so favorable a situation as do sodium and potassium, fairly accurate work on certain types of samples may be done if the limitations of the procedure, due to interference, are clearly understood beforehand.

In developing our method, several techniques were tested. It is possible to prepare calibration curves made by plotting light ratio readings against calcium content of several standard samples. Unknown samples can then be analyzed by comparing the light ratio readings they yield with the curve.

The error introduced by interference of sodium light can be allowed for by first determining the sodium content of the unknown, then preparing standard solutions of similar sodium content to obtain a calibration curve. Another way is to make a sodium interference curve using standard solutions, then determine the sodium content of the sample, and read the required calcium correction from the curve.

Magnesium also affects the determination of calcium, the interference reaching a maximum at a magnesium concentration of about 500 ppm. The effect is overcome by purposely introducing magnesium chloride at about 1,500 ppm. into all standard solutions. This corresponds to the magnesium content of a 3g. sample of magnesite containing 42% MgO taken up in 500 cc. of water. In analysis, a 3g. sample is treated with concentrated HCl, taken to near dryness, moistened with concentrated HCl, and made up to 500 cc. with distilled water, after adding 250 ppm. lithium chloride. Table III shows the results of this procedure.

Possibilities

As mentioned in *E&MJ* for January 1948, p. 59, Northwest Magnesite Company is now using the flame photometer for routine calcium determinations, which are said to be run about 27 hours faster than with the standard oxalate precipitation method. The instrument is also being used or tested by other mining and milling companies.

By using a higher temperature flame, it is believed possible to apply the flame photometer to determination of other metals, copper, for example. This would greatly widen the instrument's usefulness.

How Europe's Mining Industry May Affect You

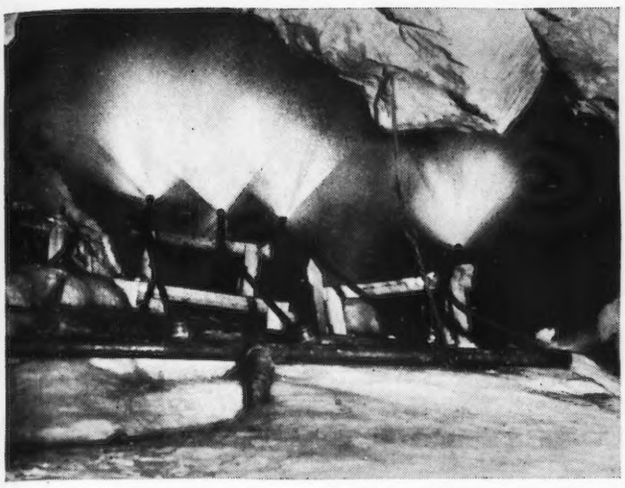
Announcing a Series of Articles on Metal and Non-Metallic Mining in the ECA Countries

1. How do European mining companies stand on ore reserves, manpower, equipment, and technology?
2. How much help do they need from the United States to get into full production again?
3. What can the United States expect from them in strategic materials, or other assistance, in return for our aid?
4. What effect will ECA spending abroad have on domestic mines?

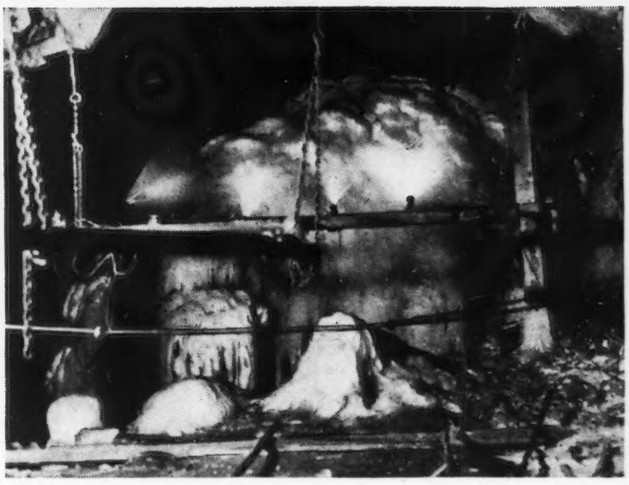
These questions are of personal interest to every member of the mining industry in the United States. We will attempt to supply the answers in a series of articles covering the mines (except coal) of the ECA countries and their colonial dependencies. We plan to present these articles in succeeding issues, approximately as follows:

OCTOBER	NOVEMBER	DECEMBER	JANUARY
Germany	France	England	Scandinavian countries
Austria	*Spain	Belgium	Greece
Italy	Portugal	Holland	Turkey
		Luxembourg	

*Not a participating country.



FOGNOZZLE AIRBLAST produces finely atomized water spray which freezes immediately on falling.



HUGE ICE CAKE formed after weeks of continuous spraying of water at sub-freezing temperatures.

Mine Air Conditioning at Noranda

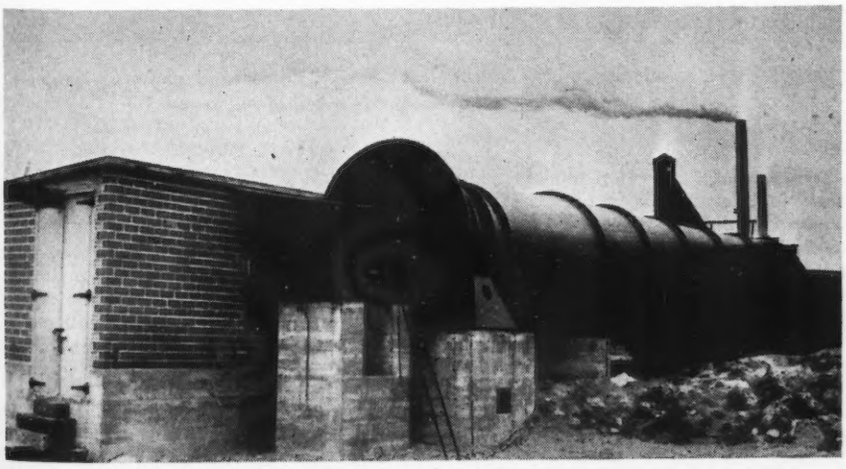
UNDERGROUND AIR CONDITIONING practice at Noranda Mines, Ltd., in Canada, consists of melting and freezing ice in open mined-out stopes to produce warm air in winter and cold air in summer. Subzero air is circulated in winter through a fine water spray, thereby raising the temperature to an average of 22 deg. F. and freezing thousands of tons of ice. In summer, the ice is melted by circulation of warm outer air, lowering the temperature of incoming air as much as 15 deg. F.

Need for this system was created by the use of granulated reverberatory furnace slag mixed with pyrrhotite mill tailing as stope fill. Oxidation of the pyrrhotite provided an excellent cementing action but produced heat which had to be removed. Mining above stope is not possible for the first year following filling as oxidation proceeds.

Experiments in removing this heat were started in 1942, under C. T. Bischoff, chief mine engineer for Noranda. Mined-out stopes were cooled for several days by passing cold air through them. Water sprays were installed at the stope entrance, but when turned on they did not furnish a fine enough spray to bring about quick freezing of the water. Moisture froze in the compressed air lines, blocking them, and water ran out into the drifts and froze there. Only 5000 tons of ice were produced in the stope which lasted three weeks in the summer, and only lowered the temperature of incoming air 5 deg. F.

The following season a fognozzle airblast system was installed. Operations were started with an outside air temperature of −30 deg. F. and immediately proved successful. The finely atomized water spray froze as it fell, with no overflow into the drifts, and formed 17,350 tons of ice. Air temperature was raised to an average of 22 deg. F. In summer the ice lasted three months with average cooling of 5 deg. F. In the hottest weather the incoming air was lowered as much as 15 deg. F. Intake and exhaust raises, in combination with inter-connected stopes at the deeper levels served to circulate the required amount of air.

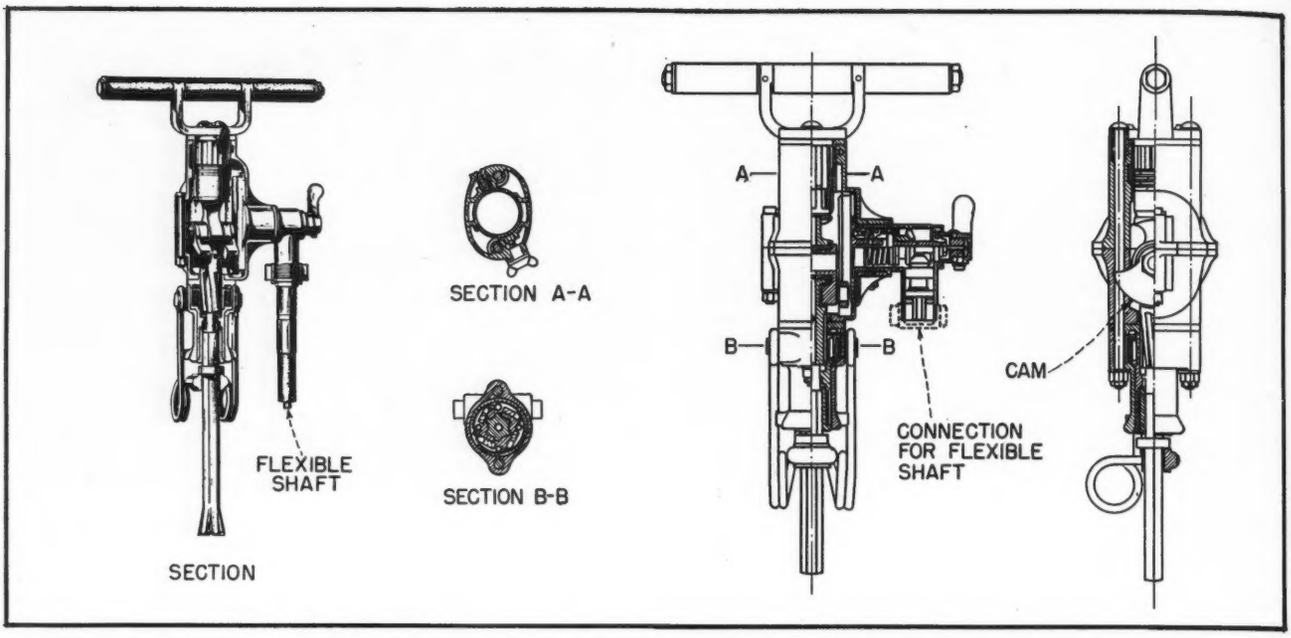
After five years, the effectiveness of this system has been proven. Cost is estimated to be $10,000 cheaper than conventional means. More than 30,000 tons of ice are now frozen, with 50,000 tons or more the eventual goal for the air conditioning system.



HOUSING FOR VENTILATION equipment consisting of 96" axial-flow fan handling 250,000 cfm. of air at a static pressure of 5¼ in. in summer, and 275,000 cfm. in winter.

96-in. Fan Employed

Heat removed from the mine daily is 324,000,000 BTU or the equivalent of 13.5 tons of coal burned. Rock temperature at 3,000 feet is 57 deg. F. with a rise of 0.42 deg. F. per 100 ft. as depth increased. Ventilating equipment includes a 96-in. axial flow fan with a capacity of 250,000 cmf. at 5¼-in. static pressure in the summer, 275,000 cfm in the winter. It is driven at a speed of 675 rpm by a Tex-Rope drive from a 250-hp. 3-phase induction motor.

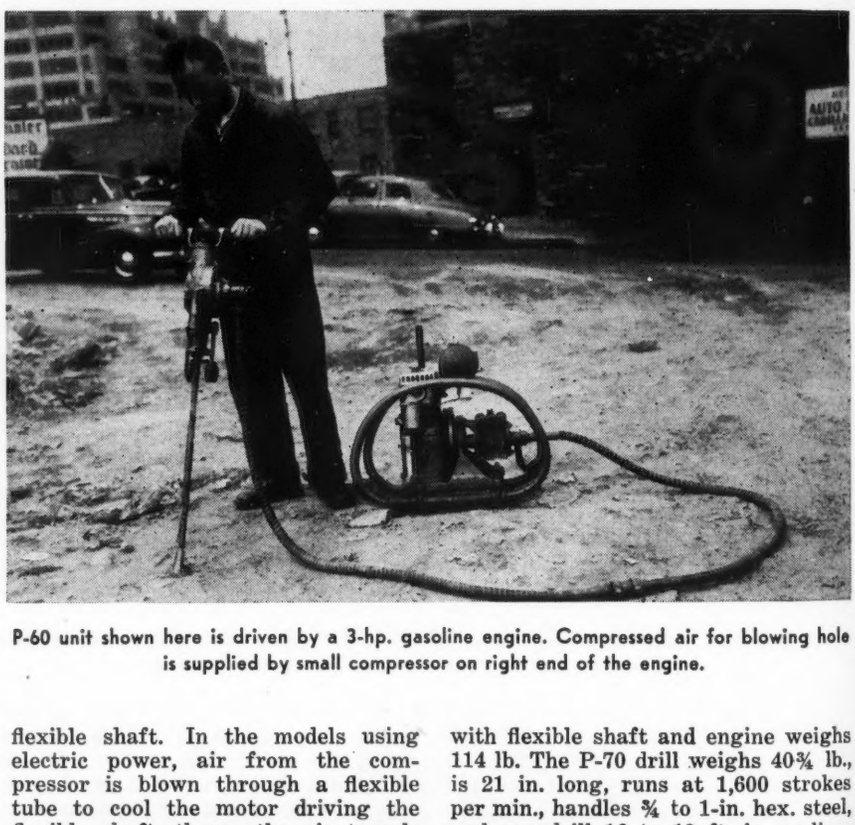


FLEXIBLE SHAFT rotates cams in drill which raise piston against a pneumatic cushion. Rebound drives hammer against drill steel.

Flexible Shaft Drives Rock Drill

Mining men and quarry operators recently witnessed a demonstration in New York of a new type of rock drill made by Brevetti Pinazza, Milan, Italy. The drill, which resembles a jackhammer, was driven by a flexible shaft connected to a 3-hp. gasoline motor. Compressed air for the drill is produced in a small auxiliary compressor mounted on the motor. However, it is not used to power the drill as in conventional rock drills. Instead, the compressed air is used to blow the hole and to provide a constant pneumatic cushion against which the piston of the drill is forced by rotating cams in the drill. The piston hammer rebounds and strikes the drill steel the instant the head of the piston is released by the rotary cams. Compressed air travels from compressor to drill through the flexible-shaft housing. Rotation of the steel is produced by a conventional spring-mounted pawl and ratchet device which engages the spiral-fluted lower end of the piston, and also rotates the chuck parts.

Chief advantage claimed for the drill is that its power requirements are small. The unit can be transported readily, on horseback if necessary, to inaccessible areas for prospecting, road building or other projects requiring drilling and blasting. The drills are now used in Europe, and in Argentina, Colombia, Peru and Mexico. They are made in two sizes, the P-60 requiring 3.5 hp., and the P-70 requiring 5.5 hp. Electrical motors can be used instead of gasoline-powered motors. In such installations, the P-60 type requires a 1½-hp. motor to drive the compressor, and a 1½-hp. motor to drive the flexible shaft. In the models using electric power, air from the compressor is blown through a flexible tube to cool the motor driving the flexible shaft, thence the air travels through the flexible-shaft housing and into the rock drill, performing the same functions as in the gasoline-powered drills.



P-60 unit shown here is driven by a 3-hp. gasoline engine. Compressed air for blowing hole is supplied by small compressor on right end of the engine.

Other data on the drills is as follows: The P-60 drill weighs 34½ lb., is 18 in. long, operates at 1,600 strokes per min., handles ¾-in. hex. steel and can drill up to 6½ ft. in medium soft and hard ground. The P-60 complete with flexible shaft and engine weighs 114 lb. The P-70 drill weighs 40¾ lb., is 21 in. long, runs at 1,600 strokes per min., handles ¾ to 1-in. hex. steel, and can drill 16 to 19 ft. in medium ground, and 9 to 10 ft. in hard rock. Total weight of the P-70 drill plus flexible shaft and engine is 149 lb.

A clutch is installed on the engine shown here which disengages whenever the load on the flexible shaft becomes excessive or the drill steel sticks. For further information, write to Central Industries, Ltd., 30 Church St., New York 7, N. Y.

MARKETS—Trends and Prices

Strong Demand for Copper, Lead and Zinc Continues—Foreign Silver Price Steadies After Dip to 72¾c.

HIGHER PRICES FOR copper, lead and zinc that prevailed throughout August failed to dampen the buying movement in these metals. Inflation controls passed at the recent short session of Congress were concerned chiefly with consumer credits, or time payments. This action is not calculated to influence business in basic materials for some time to come. The corrective movement in grain prices, set off by excellent crop prospects, made no impression on buyers of metals, most of whom feel certain that the demands for their products will continue at boom levels over the remainder of the year. European political developments, that made for nervousness in most security markets, also were ignored by market men.

The program of the Economic Cooperation Administration has not yet advanced to the point where it can be said to have materially influenced foreign trade in non-ferrous metals. Section 202 of the ECA Act has been amended and it now states that the determination of the market price is to be made by the ECA Administrator in a manner reflecting commonly accepted trade practices. Confusion exists over obtaining metals from countries listed by ECA as suppliers. Companies operating mining properties, it appears, have not been consulted in setting up quotas.

In view of the fact that the higher prices that became effective late in July or early in August resulted in a sharp advance in our monthly averages, the E&MJ price index jumped from 164.55 in July to 177.68 in August, a new high.

Working with the Munitions Board, the National Association of Manufacturers obtained a statement on the buying program for the third quarter of 1948 on critical and strategic materials needed for the stockpile. This publicity, it was argued, would tend to allay fears entertained by producers and consumers that the buying program would upset the economy. The list of materials, as well as quantities involved, appearing elsewhere on this page, was generally accepted as reasonable.

Copper at 23½c., Valley

Kennecott sold copper early in August at 21½c., Valley, but moved up to the 23½c. basis on August 11, after withdrawing from the market on each of the two preceding days. Uncertainty over what action Kennecott would take disappeared when it became known that the fabricating units of that important producer had already recognized the higher selling basis in pricing their products. Anaconda and Phelps Dodge advanced to 23½c. soon after the small producers initiated the move late in July.

Demand for copper from domestic consumers did not suffer because of the higher market. In fact, purchases for August shipment totaled around 108,000 tons, and the rate of buying for September pointed to another heavy sales period. Though it was felt in some quarters that the pipelines are about filled up and inventories are getting back to normal, the inflationary forces are still active and in these circumstances prices are not regarded as dangerously high so far as the major non-ferrous metals are concerned.

The foreign division of the copper market was less active during August than in prior months, due in part to a difficult exchange situation. However, the price abroad, measured in terms of dollars, became established at 23½c., f.a.s. New York, almost as soon as the higher price was announced in the domestic trade.

Consumption of copper in the United States based on figures compiled for the fabricating division of the industry amounted to 103,540 tons in July, which compares with 119,422 tons in June. The decline resulted largely from a slackening in operations during the vacation period. Deliveries of refined copper to fabricating plants in the first seven months of 1948, and consumption at these plants, in tons, was as follows:

	Deliveries	Consumed
January	118,855	127,227
February	106,823	115,238
March	122,988	120,167
April	116,475	117,331
May	113,389	112,730
June	111,927	119,422
July	108,309	103,540
Totals	798,766	815,655

Refineries on the Atlantic seaboard advanced their premiums on special shapes to offset higher costs. For standard ingots an extra 0.0875c. per pound is charged over ordinary forms of wirebars and ingot bars; for slabs the premium is 0.225c. and upward; for cakes 0.275c. and upward; and billets 1.05c. and upward, depending on weight and dimensions. Phelps Dodge increased its discount on cathodes to 0.15c. per pound, but other refineries held at 0.125c.

Lead Remains Tight

The supply situation in lead failed to improve during August, and most consumers carried on as if they would never again be in the favorable position of obtaining all of the lead required to meet their demands. The strike at the Southeast Missouri mines of St. Joseph Lead reduced the supply by several thousand tons. July production of refined lead in this country amounted to 40,458 tons, against 47,227 tons in June, and the strike accounted for most of the loss. Imports of pig lead in the first half of 1948 have averaged around 15,000 tons a month. Attracted by high prices and the need for dollar exchange, the movement of foreign lead into this country is bound to increase, experts believe, and this may eventually bring about an easier situation in the metal.

Common lead held at 19½c., New York, throughout the month. In Canada, the leading interest raised the price to the basis of 18¾c. per pound, Montreal or Toronto.

Strikes Cut Zinc Supply

Three zinc smelters were down because of labor strife, resulting in a drop in current production. The plants are: Fairmont City and Hillsboro, Ill., of the American Zinc, Lead & Smelting Co.; and Fort Smith, Ark., of the Athletic Mining & Smelting Co. Demand for both Prime Western and Special High Grade continued active, with most producers well sold up.

Shipments of slab zinc by smelters during July amounted to 67,497 tons, of which 61,469 tons went to domestic

Stockpile Program for Third Quarter

Metals, ores, and non-metallic minerals purchased or contracted for in the current quarter for delivery to the stockpile before June 30, 1949, are as follows:

	Quantity
Asbestos, chrysotile, ton	1,100
Asbestos, amosite, ton	1,900
Bauxite, metallurgical, long ton	(a) 435,000
Bauxite, abrasive, long ton	(a) 68,000
Beryllium ore, ton	250
Bismuth, lb.	100,000
Cadmium, lb.	300,000
Chromite, metallurgical, long ton	(a) 30,000
Chromite, refractory, long ton	1,250
Columbite, lb.	(a) 1,100,000
Corundum, lb.	125,000
Copper, ton	30,000
Diamonds, ind'l stones, carats	(a) 350,000
Diamonds, crushing bort, carats	100,000
Graphite, amorphous lump, ton	(a) 1,000
Graphite, flake, crucible, ton	300
Graphite, flake, lubricant, ton	(a) 500
Kyanite, ton	1,000
Lead, ton	16,000
Manganese, metallurgical, long ton	(a) 350,000
Manganese, battery, long ton	(a) 20,000
Mica, block, lb.	(a) 80,000
Mica, film, lb.	(a) 125,000
Mica, splittings, lb.	(a) 1,120,000
Monazite, ton	(a) 500
Nickel, ton	(a) 7,500
Talc, block, ton	(a) 250
Tin, long ton	(a) 4,500
Zinc, ton	16,000

(a) Expected total for the fiscal year.

consumers, 4,190 tons for export, and 1,838 tons to the Government. With production in July at 69,822 tons, stocks increased moderately to 45,605 tons on hand at the end of the month, the American Zinc Institute reports.

Quotations for zinc remained firm on the basis of 15c. for Prime Western, East St. Louis. In the export market the price advanced from 15¼c., f.a.s. Gulf ports, to 15½c.

Stocks of pig tin in the hands of the Office of Metals Reserve at the end of July totaled 37,118 long tons, against 24,555 tons at the beginning of the year. Consumption of pig tin in this country has been held down to around 5,000 tons a month. There were no price developments in tin.

Silver of foreign origin became unsettled during a period of inactivity that finally resulted in an unexpected drop in the Official quotation on Aug. 13 of 1⅞c. an ounce. Business improved on the decline. The market steadied later in the month on prospects of reduced offerings from Mexico, because of a coinage program, and uncertainty over the imposition of a 15% tax on exports that may be applicable to metals. There was some hope in market circles that silver would not be included in the special tax that has been imposed to offset a decline in the value of the peso, from 20.70c. to around 14.75c. The London market for silver also was unsettled, following the trend established here.

Quicksilver remained inactive, but the price in New York was maintained at $75 per flask on round lots throughout the month. The fact that leading European producers raised their price $2 per flask exerted little influence on the situation here. Japanese metal was a factor in this market.

Refined platinum was strong early in the month in anticipation of improved buying for the jewelry trade. Up to the close of the month the buying did not materialize and the undertone appeared to be no more than steady.

Manganese ore was firmer, with small lots selling at a premium over the going contract basis on deliveries extending over the remainder of 1948.

Major Metals

U. S. DAILY AND AVERAGE PRICES

1948 Aug.	Electrolytic Copper (a) Domestic	(b) Export	Straits Tin New York	Lead New York	Lead St. Louis	Zinc East St. Louis
2	23.200	23.425	103.000	19.500	19.300	15.000
3	22.900	23.425	103.000	19.500	19.300	15.000
4	22.400	23.425	103.000	19.500	19.300	15.000
5	22.725	23.425	103.000	19.500	19.300	15.000
6	22.250	23.425	103.000	19.500	19.300	15.000
7	No Market	23.425	103.000	19.500	19.300	15.000
9	23.200	23.425	103.000	19.500	19.300	15.000
10	23.200	23.425	103.000	19.500	19.300	15.000
11	23.200	23.425	103.000	19.500	19.300	15.000
12	23.200	23.425	103.000	19.500	19.300	15.000
13	23.200	23.425	103.000	19.500	19.300	15.000
14	No Market	23.425	103.000	19.500	19.300	15.000
16	23.200	23.425	103.000	19.500	19.300	15.000
17	23.200	23.425	103.000	19.500	19.300	15.000
18	23.200	23.425	103.000	19.500	19.300	15.000
19	23.200	23.425	103.000	19.500	19.300	15.000
20	23.200	23.425	103.000	19.500	19.300	15.000
21	No Market	23.425	103.000	19.500	19.300	15.000
23	23.200	23.425	103.000	19.500	19.300	15.000
24	23.200	23.425	103.000	19.500	19.300	15.000
25	23.200	23.425	103.000	19.500	19.300	15.000
26	23.200	23.425	103.000	19.500	19.300	15.000
27	23.200	23.425	103.000	19.500	19.300	15.000
28	No Market	23.425	103.000	19.500	19.300	15.000
30	23.200	23.425	103.000	19.500	19.300	15.000
31	23.200	23.425	103.000	19.500	19.300	15.000
AVERAGES FOR MONTH						
Aug.	23.085	23.425	103.000	19.500	19.300	15.000
AVERAGES FOR WEEK						
Aug.						
4	22.915	22.675	103.000	19.500	19.300	15.000
11	22.915	23.425	103.000	19.500	19.300	15.000
18	23.200	23.425	103.000	19.500	19.300	15.000
25	23.200	23.425	103.000	19.500	19.300	15.000
CALENDAR WEEK AVERAGES						
Aug.						
7	22.695	23.425	103.000	19.500	19.300	15.000
14	23.200	23.425	103.000	19.500	19.300	15.000
21	23.200	23.425	103.000	19.500	19.300	15.000
28	23.200	23.425	103.000	19.500	19.300	15.000

Silver, Gold and Sterling

DAILY AND AVERAGE PRICES

1948 Aug.	Sterling Exchange "Checks"	Silver (c) New York	Silver London	Gold London	Gold (d) United States
2	402.750	74.625	Holiday	Holiday	$35.00
3	402.750	74.625	45d.	173s 3d.	35.00
4	402.750	74.625	45d.	173s 3d.	35.00
5	402.750	74.625	45d.	173s 3d.	35.00
6	402.750	74.625	45d.	173s 3d.	35.00
7	(e)	(e)	(e)	(e)	35.00
9	402.750	74.625	45d.	173s 3d.	35.00
10	402.750	74.625	45d.	173s 3d.	35.00
11	402.750	74.625	45d.	173s 3d.	35.00
12	402.750	74.625	45d.	173s 3d.	35.00
13	402.750	72.750	45d.	173s 3d.	35.00
14	(e)	(e)	(e)	(e)	35.00
16	402.750	73.250	44d.	173s 3d.	35.00
17	402.750	73.750	44.5d.	173s 3d.	35.00
18	402.750	73.500	45d.	173s 3d.	35.00
19	402.750	73.250	44.5d.	173s 3d.	35.00
20	402.750	72.750	44.5d.	173s 3d.	35.00
21	(e)	(e)	(e)	(e)	35.00
23	402.750	72.750	44d.	173s 3d.	35.00
24	402.750	72.750	44d.	173s 3d.	35.00
25	402.750	72.750	44d.	173s 3d.	35.00
26	402.750	73.250	44d.	173s 3d.	35.00
27	402.750	73.750	44.5d.	173s 3d.	35.00
28	(e)	(e)	(e)	(e)	35.00
30	402.750	74.000	45d.	173s 3d.	35.00
31	402.750	74.250	45d.	173s 3d.	35.00
AVERAGES FOR MONTH					
Aug.	402.750	73.835	44.667	—	$35.00
AVERAGES FOR WEEK					
Aug.					
4	402.750	74.625	—	—	
11	402.750	74.625	—	—	
18	402.750	73.575	—	—	
25	402.750	72.850	—	—	

Calendar week averages: New York Silver: Aug. 7th, 74.625; 14th, 74.250; 21st, 73.300; 28th, 73.050.

(e) Not quoted (Saturday).

THE above quotations for major non-ferrous metals are our appraisal of the important United States markets, based on sales reported by producers and agencies. They are reduced to the basis of cash, New York or St. Louis. All prices, except gold and silver, are in cents per pound.

(a) Net prices at refineries on Atlantic seaboard. To arrive at the delivered New England basis add 0.300c. per pound, the average differential for delivery charges.

(b) Our export quotation for copper reflects prices obtaining in the open market and is based on sales in the foreign market reduced to the f.o.b. refinery equivalent, Atlantic seaboard. On f.a.s. transactions we deduct 0.075c. for lighterage, etc., to arrive at the f.o.b. refinery quotation.

Copper, lead and zinc quotations are based on sales for both prompt and future deliveries; tin quotations are for prompt delivery only.

Quotations for copper are for the ordinary forms of wirebars and ingot bars; cathodes are sold at a discount of 0.125c. to 0.15c. per pound.

Quotations for zinc are for ordinary Prime Western brands. Zinc in New York commands a premium over the St. Louis basis equal to the freight differential. Contract prices for High Grade zinc delivered in the East and Middle West in nearly all instances command a premium of 1c. per pound over the current market for the Prime Western but not less than 1c. over the *Engineering and Mining Journal's* average quotation for Prime Western for the previous month; the premium on Special High Grade in most instances is 1¼c.

Quotations for lead are for common lead. Corroding lead commands a premium of 10 points.

(c) Determined by Handy & Harman on the basis of market prices for bar silver, in cents per troy ounce .999 fine, in amounts of 50,000 oz. or more, nearby delivery, New York. Price quoted is in cents and one-eighth cent fractions and is usually about one-quarter cent below the market to allow for delivery, carrying, and marketing. In addition to foreign silver, the quotation also applies to domestic and Treasury silver if such silver enters into the market. The Treasury's purchase price of newly mined domestic silver 90.5c. per troy ounce 1000 fine, effective July 1, 1946. London silver in pence per troy ounce, basis .999 fine.

(d) U. S. Treasury's gold price. Actual payment by the United States Treasury for gold is at 99.75 per cent of the price quoted by the Treasury, which is equal to $34.9125.

MARKETS—Trends and Prices

Miscellaneous Metals

(Monthly Averages)

Average prices of miscellaneous metals for July and August:

	July	Aug.
Quicksilver, N. Y., flask	75.423	75.000
Antimony (a)	38.170	38.170
Antimony, bulk, Laredo	35.000	35.000
Antimony, in cases, Laredo	35.500	35.500
Antimony, Chinese (b)	....	....
Platinum, oz. troy	89.154	93.000
Cadmium (c)	175.000	190.000
Cadmium (d)	177.500	195.000
Cadmium (e)	180.000	200.000
Aluminum, ingot	16.000	16.000
Magnesium, ingot	20.500	20.500

(a) New York, packed in cases, in lots of 5 tons or more but less than a carload. (b) Nominal. (c) Producer's price for commercial sticks. (d) Average producers' and platers' quotations. (e) Special shapes sold to platers.

E. & M. J. Weighted Index of Non-Ferrous Metal Prices

(100 is composite for 1922-3-4. Copper, Lead, Zinc, Tin, Silver, Nickel, Aluminum)

1938	73.67	1943	88.74
1939	77.71	1944	88.74
1940	79.22	1945	90.86
1941	83.49	1946	110.06
1942	86.80	1947	149.46

	1946	1947	1948
January	96.42	140.88	154.20
February	96.42	140.42	155.63
March	96.42	150.71	155.63
April	96.42	153.14	160.67
May	96.42	154.03	161.33
June	107.16	150.05	162.30
July	117.11	148.73	164.55
August	113.32	149.35	177.68
September	113.32	150.80	....
October	114.25	151.05	....
November	131.23	151.92	....
December	142.19	152.48	....

Official London Prices

Since Dec. 18, 1939, the British Ministry of Supply has named maximum delivered prices for the major nonferrous metals. Prevailing delivered prices for consumers in the United Kingdom follow:

	Per Long Ton £	s.	d.
COPPER:			
Electrolytic, high conductivity	132	0	0
Fire refined, high conductivity	132	0	0
Fire refined, high grade	131	10	0
Fire refined, min. 99.2 percent	131	0	0
Fire refined, min. 99.7	130	10	0
Hot rolled black wire rods	138	0	0
LEAD:			
Soft, foreign, duty paid	90	0	0
Soft, Empire	90	0	0
English refined	91	10	0
ZINC:			
Foreign (G.o.b.), duty paid	75	0	0
Domestic (G.o.b.)	75	0	0
Prime Western and debased	75	0	0
Refined and electrolytic	75	15	0
Minimum 99.99 percent	77	5	0
TIN:			
Ingot, 99 percent	569	0	0

Miscellaneous Metals, Ores, Minerals

Quotations cover wholesale lots, prompt shipment, f.o.b. New York unless otherwise stated

MISCELLANEOUS METALS

(Aug. 31, 1948)

Aluminum, ingot, 99 plus percent, lb. (base price)	16c.
Antimony, spot, lb., 5 tons and up but less than carload, in cases	38.17c.
Bismuth, ton lots, lb.	$2.00
Cadmium, commercial sticks, lb.	$1.90
Calcium, lb., ton lots, 98 percent, cast	$1.95
Chromium, 97 percent grade, lb., spot	$1.02
Cobalt, 97 to 99 percent, per lb.	$1.65
Indium, troy oz.	$2.25
Nickel, electrolytic cathodes, lb., f.o.b. Port Colborne (a)	40c.
Magnesium, 99.8 percent, carloads, lb., producer's plant	20½c.
Palladium, troy oz.	$24.00
Platinum (Official quotation wholesale lots), troy oz.	$93.00
Quicksilver, flask of 76 lbs., 25 flasks or more	$75.00
Selenium, 99.5 percent, lb.	$2.00
Silicon, minimum 97 percent, spot, carloads, lb.	14.75c.
Tellurium, lb.	$1.75 nom.
Thallium, 100 lb. or more, lb.	$15.00
Titanium, 96 to 98 percent, lb.	$6.00@$7.00

(a) Includes U. S. duty.

METALLIC ORES

Beryllium Ore, 10 to 12% BeO, f.o.b. mine, per unit	$20.00@$24.00
Chrome Ore, per long ton, f.o.b. cars Atl. ports, dry 48% Cr_2O_3, 2.8 to 1 ratio	$34.00@$35.00
48% Cr_2O_3, 3 to 1 ratio	$38.00@$42.00
Iron Ore, Lake Superior, Lower Lake ports, long ton:	
Old Range bessemer	$6.60
Mesabi bessemer	$6.35
Old Range non-bessemer	$6.45
Mesabi, non-bessemer	$6.20
Lead (Galena), 80 percent, Joplin, Mo., ton	$257.37
Manganese Ore—Per long ton unit of Mn. basis 48 percent manganese, subject to premiums and penalties, f.o.b. cars Atlantic and Gulf ports, duty paid, 70.6@72.6c.	
Molybdenum Ore, 90%, per lb. of MoS_2 f.o.b. mines	45c.
Tantalite, 60% concentrate, per lb.	$2.00@$2.75
Tungsten Ore, per unit of WO_3:	
Foreign, 60 percent, duty paid	$23.50@$24.00
Domestic, scheelite, 60 percent and upward	$28.00
Vanadium Ore, per lb. of contained V_2O_5 f.o.b. mines	27½c.
Zinc Ore, Prime, 60 percent concentrate, Joplin, Mo., per ton	$95

METALLIC COMPOUNDS

Arsenious Oxide (arsenic trioxide) lb., in bbl., carload lots, delivered	6¼c.
Cobalt Oxide, 70 to 71 percent, lb., ceramic grade	$1.27@$1.30
Copper Sulphate, 100 lb.	$7.60

ALLOYS

Beryllium Copper, 4 percent Be, per lb. of contained Be	$20.50
Ferrochrome, 65 to 69 percent, per lb. of Cr contained	18.60c.
Ferromanganese, 78 to 82 percent, gross ton	$145.00
Ferromolybdenum, 55 to 65 percent Mo, lb. of Mo, contained	95c.
Ferrosilicon, 50 percent, per lb. of contained Si	9.3c.
Ferrotungsten, 75 to 80 percent, lb. of W contained	$2.25
Ferrovanadium, per lb. of V delivered	$2.90
Silicomanganese, 1¼ percent C, per lb. contracts	7.8c.
Spiegeleisen, per long ton, 19@21%	$57.00

NON-METALLIC MINERALS

Asbestos, f.o.b. Canada (Quebec) mines (U. S. funds), ton:	
Crude No. 1	$896@$960
Crude No. 2	$350@$545
Spinning fibers	$204@$378
Paper stock	$51@$78
Shorts	$24@$46
Vermont, f.o.b. Hyde Park:	
Shingle stock	$97.00@$107.00
Paper stock	$68.50@$85.00
Waste	$51.00
Refuse or shorts	$25.50@$46.50
Barytes, f.o.b. mines:	
Georgia, crude, per long ton	$11.50@$12.00
Missouri, 93 to 94 percent $BaSO_4$, per short ton	$9.00@$9.25
Bauxite, long ton:	
Domestic, crude, 50 to 52 percent (not dried)	$4.00@$5.00
Domestic, chemical, 55 to 58 percent	(a)$8.50@$9.00
Domestic, abrasive, 80 to 84 percent	$16.50
China Clay, f.o.b. mines, ton:	
South Carolina and Georgia, No. 1, airfloated, bulk	$8.00@$9.00
North Carolina, ceramic grade	$18@$22
Feldspar, bulk ton:	
Potash feldspar, 200 mesh	$17.00
Glass spar, white, 20 mesh	$11.75@$12.50
Fluorspar, f.o.b. mines, bulk, Kentucky and Illinois, 70 percent, all rail movement, ton	$35.00
Acid 97.5 and 1 percent, bulk, ton	$42.00
Fuller's earth, f.o.b. Georgia or Florida, ton	$7.00@$14.00
Magnesite, per ton dead-burned, f.o.b. Washington	$31
Mica — Domestic f.o.b. mines. Punch, 12 to 18c. per lb. according to size and quality. Sheet, clear, 1½ x 2 inch, 60 to 65c.; 2 to 2 inch, 95c. to $1; 2 x 3 inch, $1.35; 3 x 3 inch, $1.80; 3 x 4 inch, $2.25; 3 x 5 inch $3.; 4 x 6 inch, $4; 6 x 8 inch, $6. Wet ground, very fine, $130@$170 per ton. Bulk sales, dry ground, $40@$80 per ton. Scrap, $25 and up.	
Ocher, Georgia, ton, in sacks	$24.00
Pyrites, Spanish, per long ton unit of S, cif. Atlantic ports	(a)12@14c.
Sulphur, Texas, mines, long ton	$16.00@$18.00
Talc, f.o.b. works, ton:	
New York, purified	$18.50@$20.00
Vermont, extra white	$12.50
Tripoli, Missouri, ton:	
40 mesh, cream colored	$14.50

(a) Nominal.

IRON AND STEEL

Pig iron, Valley furnaces, gross ton: Basic	$43.00
Steel, f.o.b., Pittsburgh billets, net ton	$52.00
Structural shapes, 100 lb.	$3.25

WASHINGTON REFLECTIONS

McGraw-Hill Washington News Bureau

MMSW Left-Wing In Last Ditch Fight

Because of their refusal, or inability, to sign the anti-Communist affidavits required by the Taft-Hartley law, leaders of the left-wing Mine, Mill and Smelter Workers Union (CIO) now find themselves with their backs to the wall in a battle that may well break their grip on the union, if it does not wreck the organization itself.

In the view of Washington observers familiar with the situation, the Mine, Mill union is about bankrupt, both financially and spiritually, and its day as an aggressive member of the CIO family is coming to an end. It is predicted that the union will gradually disintegrate, its various locals being absorbed by other unions, both CIO and AFL.

Highly significant are the facts that the Mine, Mill international leadership in order to keep contracts in force, has backed down on several issues it once regarded as vitally important, and it has continued working in one instance with no contract at all. Also, the Mine, Mill leaders are at odds with the CIO high command over the Communist issue, and other CIO unions have taken locals away from MMSW with little or no attempt being made by Philip Murray's office to stop it. Lacking the support of their own CIO executive board, and unable to obtain NLRB assistance because of non-compliance with the law, the MMSW leadership faces a bleak prospect.

Despite all that, however, the left-wingers put up a stiff fight to hold their grip on the employees of St. Joseph Lead Co. and on 1,300 employees at four properties of American Zinc Lead and Smelting Co., where strikes were on as this was written.

Early in August Andrew Fletcher, president, and Clinton H. Crane, chairman, St. Joseph Lead Co., informed stockholders that there had been no negotiations with the union since July 7, the point at issue being solely the union leaders' refusal to file the necessary anti-Communist affidavits. St. Joe is not opposed to a union for its Southeast Missouri employees, whether it be independent, CIO or AFL, and the company, said Fletcher and Crane, stands ready to deal with any representatives its employees may choose. St. Joe will not, however, deal with representatives of a Communist-influenced organization.

The issue was also stated by Howard Young, president of American Zinc, on Aug. 13. "The company has stated that it will not enter into negotiations for a new contract with any union unless the union complies with the law by filing anti-Communist affidavits. The officers of the union (MMSW) have informed the company that they will not sign these affidavits.

"The company has offered employment to all who want to work under the same wages and working conditions that have prevailed during the contract period, and stands ready to negotiate a contract any time in future that the anti-Communist affidavits are filed."

Mr. Young pointed out that only the company's plants at Hillsboro and Fairmont City, Ill., Columbus, Ohio, and Metalline Falls, Wash., were shut down over the Communist issue. Unions at all the company's other plants have complied with the law and are at work. A "third round" wage increase has been granted at all plants now working or on strike.

As pointed out in an article in *E&MJ* for May, 1948, this is part of the price the industry must pay to rid itself of a union leadership rotten with communism. These men are hard and unprincipled, and the struggle to oust them will be bitter, although it can have only one outcome. The real sufferers, of course, are the rank-and-file union members who are misled into striking over an issue that concerns them only indirectly.

There is no question of wages or working conditions involved in these strikes, only the question of a union leader's loyalty to his country. Here, again, is a situation that calls for the clearest possible explanation to employees of the real issues involved, not only right now but indefinitely into the future.

As a sidelight on these strikes, one notes that as of Aug. 1, national and international unions that have complied with the law by filing anti-Communist affidavits included 30 of the 45 CIO unions and 93 of the 105 AFL unions.

Mining Industry Groups To Outline Steel Needs

Warned by John C. Virden, chief of the Office of Industry Cooperation, that steel is increasingly tight and that demands for steel must be "realistic", representatives of 101 manufacturers of mining equipment met in Washington, Aug. 18, to discuss allocation of steel for mining machinery. The group also appointed a committee to prepare and submit a report to the OIC outlining mining manufacturers' needs for steel.

Groundwork for this report, and for a similar report outlining needs of mining companies for steel for maintenance, repair and operating supplies, was done by Dennis F. Haley, of Climax Molybdenum Co., and a committee including Burdett Gibson, of Goodman Manufacturing Co., Harold Montag, Joy Manufacturing Co., and T. W. Hunter and Paul Tyler, Bureau of Mines. The entire job is undertaken as a part of the duties of the National Minerals Advisory Council.

Once the report is approved by the Council, it must get over these hurdles: approval by the OIC, the Department of Commerce, the Department of Justice, and a public hearing. Thereafter still another committee must be appointed to work out details of actually handing the steel around. This must be done in cooperation with the OIC's Steel Industry Advisory Committee. The steel is, apparently, a long way off.

ECA "Clarifies" Pricing Of Bulk Commodities

For some weeks past, sales of metals to foreign countries that were financed by ECA funds have been held up pending a decision by the ECA as to the definition of a bulk commodity. Section 202 of the ECA Act specified that no ECA money could be used to buy bulk commodities for shipment abroad at prices higher than those prevailing in domestic U. S. markets.

This section, it is believed, was designed to prevent use of U. S. dollars to buy Argentine wheat at greatly inflated prices. Its effect went much farther than wheat, however, because the ruling could be applied to metals as well. Strict application of the rule would have made metal sales abroad financed by ECA almost impossible because of the legal tangle involved in defining the domestic market.

Early in August, Paul Hoffman, ECA Administrator, issued a 9,000-word "clarification" that was supposed to end doubts as to legality of sales of commodities at prices other than those of the domestic market. Experts in the fields of banking and foreign trade said that interpretation of the clarification statement would require many days of careful study.

With some misgivings, producers of metal were going ahead with sales abroad, in the moderate amounts available, basing their prices on the assurance of ECA that final approval of prices will be made by the Administrator "in a manner reflecting common trade practices."

What Would Dewey Do With Dept. of Labor

President Truman's recent appointment of Maurice J. Tobin, former governor of Massachusetts, as Secretary of Labor has aroused speculation in Washington as to what Thomas E. Dewey would do with the Department of Labor if he were elected. The answer depends partly on Dewey's own views and partly on what comes out of Herbert Hoover's commission to study the organization of the executive branch of the Government.

In 1944, Dewey promised to strengthen the Department of Labor and to appoint a union man as its head. Dewey would still be inclined to restore dignity to the Department, but he is not expected to appoint a union member to the post of secretary, if he has the chance to make the appointment.

More than likely, Dewey would appoint an outstanding figure, a man universally accepted as friendly to organized labor, one who could be called a union "man" but not a union "member". Former Senator Bob LaFollette is mentioned as a strong possibility for the job.

The Hoover Commission will not make a separate study of labor matters in the Federal Government. Instead it will refer to labor incidentally in considering other aspects of Government. These references will be collected and analyzed in a special report by Dr. George W. Taylor, former chairman of the War Labor Board.

Here are some of the Federal agencies, other than the Department of Labor, that now engage in activities of one kind or another affecting labor: State Department, Economic Cooperation Administration, Navy, Army, Air Forces, National Security Resources Board, Railroad Retirement Board, National Railway Mediation Board, Federal Mediation and Conciliation Service, Commerce Department, Federal Security Agency, Department of Agriculture, Civil Service Commission, and last but not least, the White House, itself.

World's Safety Research Men Hold Meeting

The Fifth International Conference of Directors of Mines Safety Research will be held Sept. 20-25, 1948, at the Central Experiment Station, Bureau of Mines, Pittsburgh, Pa. The first conference was held in England in 1931, and subsequent conferences were held every two years thereafter in France, Germany and Belgium. In 1939 a conference was scheduled for Pittsburgh but was deferred due to the war.

The conference is not a safety meeting for operators, as such, but deals with fundamental scientific research on which safety recommendations are based. Subjects to be dealt with in general cover explosives, fire damp, coal dust, electricity and haulage, safety and mine fires. The conferences have proven worthwhile from the standpoint of cooperation and coordination of mine safety research in various countries. For example, each country best qualified to handle a certain aspect of a problem concentrates its research on that.

Chairman of the committee arranging the conference is H. P. Greenwald, superintendent of the Experimental Station, Bureau of Mines, Pittsburgh, and cooperating with the Bureau of Mines is a committee of industry representatives headed by John T. Ryan, Jr. of the Mine Safety Appliance Co.

The sessions will open with an address of welcome by Dr. James Boyd, Director of the U. S. Bureau of Mines. During the seminars, papers will be submitted by Dr. Bernard Lewis, Dr. Irving Hartmann, Dr. Guenther Von Elbe, all of the Bureau's Fuels and Explosives Division; John J. Forbes, Dr. H. H. Schrenk, S. H. Ash, E. J. Gleim and C. W. Owings, of the Health and Safety Division, and by Dr. M. A. Elliott, who has headed Bureau research on the adaptation of diesel engines for mine use.

A major topic of informal discussions will be England's experiments with mine illumination, including a report on a pit which has been floodlighted.

Official delegates have been invited from England, France, Poland, Belgium and Germany.

Capehart Committee May Favor Basing Points

Although the committee headed by Senator Homer Capehart, of Indiana, that will investigate basing point pricing, will probably not begin hearings until after the election, some idea of the committee's sympathies may be gained from its actions to date.

General counsel for the committee will be William Simon, member of a Chicago law firm that represented the Salt Producers Association five years ago when it lost a price-fixing case involving identical delivered prices.

The committee's advisory council, a 40-man group appointed by Senator Capehart early in August, includes at least seven executives of companies who have lost to the FTC in price-fixing cases in which identical delivered prices figured heavily in the evidence.

Senator Capehart, himself, wrote a letter to all members of Congress in which he stated the issue and outlined his proposals for investigating it. He said the issue is "whether sellers should be permitted to (a) sell their products throughout the United States at a uniform delivered price, or (b) absorb freight or any part thereof in sales to customers in order to compete with competitors whose plants are located closer to the customer."

Procedure will be to call a meeting of the advisory council in September, when the members will "get their assignment". The group will meet again in October or November, compare notes, and appoint a smaller group that will actually write the report to be submitted to the Capehart Committee.

Metal Shortages Bring Call For Allocation

Charles Sawyer, Secretary of Commerce, believes that allocation of copper, lead and zinc is necessary to distribute supplies of these metals equitably among domestic and foreign consumers and still leave some for the stockpile. He filed a statement to that effect on Aug. 5 with the Senate Banking and Currency Committee.

Actually, voluntary allocation of lead is already being practiced by producers. The strike at St. Joseph Lead Co.'s. properties has so reduced an already short supply that there is no other means of handling sales of the metal equitably.

Mr. Sawyer estimated deficits in civilian supply this year of 100,000 tons of copper, 124,165 tons of lead, and 47,700 tons of zinc. These figures include no allowance for stockpile metal.

Barring some sudden and unforeseen slackening in demand, there seems little chance of getting enough metal into the stockpile to satisfy the military unless allocation of metals is made compulsory. One bright spot is the willingness of the Munitions Board to make long-term contracts with domestic producers for increased production of metal for the stockpile. Prices paid will be high enough to permit operating at a profit.

This form of premium, or "incentive", payment has already been taken up by several producers, and is apparently finding acceptance. The plan has met the objection that premium metal should still belong to the producer, not the stockpiler. Most of those interested, however, recognize the validity of the argument that if the Government's money is accepted in order to finance production of a metal, the Government should have the right to buy that metal if it wants to. And right now the Government does.

Meanwhile, industry members generally were viewing Mr. Sawyer's figures with some skepticism, feeling that there was no need as yet for drastic measures to allocate metals. Late in August the Munitions Board promised eventually to reveal quantities of metals wanted for the stockpile with a view to setting up a more orderly distribution of metal.

The Munitions Board's estimates of anticipated purchases for the stockpile appear in a table on page 97.

NEWS OF THE INDUSTRY

Mining Association of Montana Convenes at Successful Meeting in Virginia City

The Tenth Summer Convention of the Mining Association of Montana, meeting in Virginia City July 30 and 31, attracted more than 400 members and interested guests. Welcomed to the city by its mayor, J. H. Vanderbeck, the convention, between business sessions, enjoyed a trip to the Easton-Pacific workings of the U. S. Grant Mining Co. and showing of the film, "Copper," depicting operations of Anaconda Copper Mining Co., as well as dances, carnivals, and reenactment of the 1863 trial and hanging of George Ives, noted road agent.

Following announcements by the secretary of the Association, Carl J. Trauerman, at the first business session, was the address of Kuno Doerr, Jr., manager of the East Helena smelter of the American Smelting & Refining Co. Speaking on "The Relation of Custom Smelters to the Small Mine Operators," Mr. Doerr pointed out the extent to which the interests of the custom smelter are the interests of the small miners. At the same meeting Dr. Francis A. Thomson, Butte, president of Montana School of Mines and Geology, spoke on "Common Sense in Mining." Final speaker was Ross D. Leisk, Kellogg, Idaho, manager of the Sunshine Mining Co., who told of the industrial and other demands for silver.

Main feature of the banquet on Saturday night was a presentation of "Details of the Greater Butte Project," by E. S. McGlone, Butte, vice president in charge of western operations of the Anaconda Copper Mining Co. Mr. McGlone's speech appears on page 80 of this issue.

Policies of Association

At the meeting Friday afternoon the following resolutions were unanimously adopted:

To reaffirm confidence in the American form of government and to resist pressure from un-American tendencies.

To urge immediate return to state and local government and (recognizing the danger of bureaucracy) the dehydration of the "Washington octopus."

To condemn the Federal policy of nationalizing large acreages rightfully belonging to the state and its citizens, as well as the imposition of royalties on all values produced regardless of cost.

To endorse and urge passage of the "National Minerals Development and Conservation Act of 1948," H. R. 6623 (pointing to the accomplishments of the Premium Price Plan).

To favor amendment of the "Contract Settlement Act of 1944" to provide reimbursement of the unrecovered costs of producing or preparing to produce strategic minerals, together with allowance for depletion and reasonable profit on such investment, during the life of the Premium Price Plan which was terminated June 30, 1947.

To urge the U. S. Treasury to permit sale of gold in any market abroad and in free and open market in this country, as well as coinage and unrestricted possession and circulation of gold in any form.

To recognize the liberal interpretation of regulations regarding mine financing by the Securities Exchange Commission and to recommend that state regulations be made to conform to SEC rules and regulations.

To take action to correct the misapplication of certain Federal funds which, the Association feels, should rightfully be used to provide access roads to and through forest reserves.

New Reclamation Plant For Texas City Smelter

The Tin Processing Corp. has contracted for the addition of a chemical plant, at a cost of about $2,700,000, to reclaim hydrochloric acid and silver from waste processing materials at its Texas City, Texas, smelter, according to an announcement by the Associated General Contractors of Houston.

Contract to design and construct the plant was awarded to the Chemical Construction Corp. of New York City, and construction is expected to start the first of next year.

Interior Department Closes Five Western Land Offices

The Department of the Interior, through President Truman's issuance of Executive Order No. 9977, closed five outmoded Federal land offices in Oregon and the Dakotas, effective July 30. District land offices of the Bureau of Land Management at Lakeview, Roseburg and The Dalles, Ore., were to be consolidated into a single land and survey office at Portland. District land offices at Bismarck, N. D., and Pierre, S. D., were to be closed and sporadic transactions in those states handled in Washington.

Line-up of Meetings At AMC Convention

The committees under Worthen Bradley, general chairman, have announced final plans for the Metal Mining Convention and Exposition of the American Mining Congress, San Francisco, September 20-23. The schedule of meetings below will be followed by two days of field trips.

Monday—The morning session on "Government Policies and the Mining Industry" is to be led by Howard I. Young, president of American Zinc, Lead & Smelting Co. Chairman of the afternoon session on "Future of Gold and Other Metals" is R. M. Hardy, president, Sunshine Mining Co. At the same hour an operating session on "Advances in Milling Practice" will be lead by John F. Myers, mill superintendent, Tennessee Copper Co., and F. M. Jardine, mill superintendent, Nevada mines division, Kennecott Copper Co.

Tuesday—The morning will be left open for inspection and study of exhibits. In addition to a vast hall filled with the latest and best in mining and milling equipment, manufacturers are providing consultants specialized in the application of their products to the miners' needs. At 2 p.m. a session on "Problems under Consideration by the National Minerals Advisory Council" will be under the chairmanship of Donald H. McLaughlin, president, Homestake Mining Co. Also meeting at 2 p.m., the operating session on "Mechanization of Mining Operations" will be led by R. J. Mechin, division manager, St. Joseph Lead Co.

Wednesday—At 10 a.m. "Labor Relations—Manpower Problems" are the topics for discussion, with J. C. Kinnear, vice president of Kennecott Copper Corp., as chairman. The operating session at the same hour, on "Open Pit and Placer Mining," will be lead by W. C. Browning, general manager, Golden Queen Mining Co. No meeting is scheduled for the afternoon.

Thursday—Henry B. Fernald, chairman, AMC Tax Committee, and Louis Ware, president, International Minerals & Chemical Corp., are co-chairmen for the Thursday morning session on "Tax Problems—Traffic—Non-Metallic Minerals." The fourth operating session, also at 10 a.m. Thursday, will cover the "Greater Butte Project," "Shaft-Sinking in the Coeur d'Alene District," and "Development and Mining of the San Manuel Orebody." In the afternoon Ira B. Joralemon, consulting engineer of San Francisco, will be chairman at the discussion on "Adding to Ore Reserves."

AEC Aids in Research on Radioactive Tracers

Dr. Thomas K. Sherwood, Dean of Engineering at Massachusetts Institute of Technology, has announced that research on the application of radioactive tracer techniques to mineral engineering problems will be expanded in the department of metallurgy at the Institute under a grant of the Atomic Energy Commission.

Under the radioactive method, studies are made by following the electron emissions from radioactive atoms which are introduced into any substances to be studied. (See pages 53 to 55, *E&MJ*, March, 1948.) For example, it is possible to "tag" copper sulphate with radioactive copper with the copper sulphate added to the mineral, sphalerite, in water, according to release issued by M.I.T. By means of a Geiger counter, it would be a simple matter to determine the amount of copper extracted from the solution. Many metallurgical problems of a more complicated nature will be studied by this method.

SEC Proposes Changes on Two Regulations

The Securities and Exchange Commission has under consideration two proposed changes which would affect the mining industry. An amendment to its regulations governing accounting instructions would add a new article 5-A to the old Regulation S-X, applicable particularly to mining companies, and would prescribe uniform treatment of such items as mine property, plant and equipment; depreciation, depletion and amortization; and promotional, exploratory or development costs. The proposed amendment is said to be part of the commission's program to provide "reasonable uniformity" of accounting presentation in financial statements filed with the commission by mining companies in the promotional, exploratory or development stage.

The SEC has proposed also a rule intended to encourage corporations offering new securities to their stockholders to furnish information on the offering in advance of registration. Under present rules advance distribution of a preliminary prospectus is authorized provided it contains substantially all the required disclosures except price and related data, usually fixed just before effective date of offering. However, the completed prospectus must be included with any offer to sell, on the effective date. The new rule would authorize a corporation making an offering to existing stockholders to substitute for the completed prospectus a simple statement of the information omitted from the preliminary prospectus, the statement to include the preliminary prospectus by reference and to be given within 20 days after previous prospectus was sent out.

CUTTING A ROAD from the main highway to the site of Republic Steel Corporation's proposed open-pit iron mine near its Chateaugay mine, Lyon Mountain, N. Y.

Republic Steel Is Developing a New Iron Mine in Northern New York and Exploring Near Antwerp

Plans for developing a new iron mine, to be known as the "81" mine, at Lyon Mountain, N. Y., in the Adirondacks, on an extension of its Chateaugay ore bed, which has been so productive of low-phosphorus ore for many years, are well under way by Republic Steel Corporation. Production to date has come from the main, or No. 1, shaft, started by the Delaware and Hudson Co. in 1919 and sunk by them to 900 ft., and deepened to 2,350 ft. in 1941 by Republic after it had acquired the property from D. & H. Eventually the "81" mine will replace the present workings that now deliver their ore to the main shaft.

The Republic corporation entered the Adirondack area as an operator in a big way in 1938 when it leased the old properties of Witherbee, Sherman & Co. at Port Henry and Mineville. The following year it leased and subsequently bought the holdings of Chateaugay Ore & Iron Co. at Lyon Mountain. Its capacity in terms of finished product for the two districts is rated at 2,500,000 tons per year. In the two districts it owns 200,000 acres.

The Chateaugay bed at Lyon Mountain lies in a synclinal trough, the No. 1 shaft, which is a 63-deg. incline, being sunk on one flank of the trough. Diagonally across the trough on the opposite flank of the syncline the site of "81" shaft has been selected, 2 to 2½ miles from the present No. 1 shaft. The new shaft will be vertical, 2,500 ft. deep and 16½x20 ft. in the rock section. The trough pitches 30 deg. along the strike and, by reason of this pitch, the ore bed comes to surface a half-mile or so up the trough from the "81" shaft. The nose of the syncline is concealed under some 15 ft. of overburden.

Here Republic is starting to strip the overburden to lay bare the ore that can be mined economically by open-pit methods. The resulting pit will be approximately 70 ft. deep. It is estimated that it will yield 500,000 to 1,000,000 tons of ore to this depth. In plan, the pit will be shaped somewhat like a horseshoe, the curved perimeter of which will be about 2,000 ft. long. Width of the pit will be about 300 ft. in the center and 150 ft. between the ends of the horseshoe.

When the spot was visited August 4, the shovel shown in the accompanying photograph had dug its way a distance of 1,700 ft. from the main road and was close to the site of the proposed pit. Three 20-ton Euclid trucks were serving for transport.

Also Exploration Work

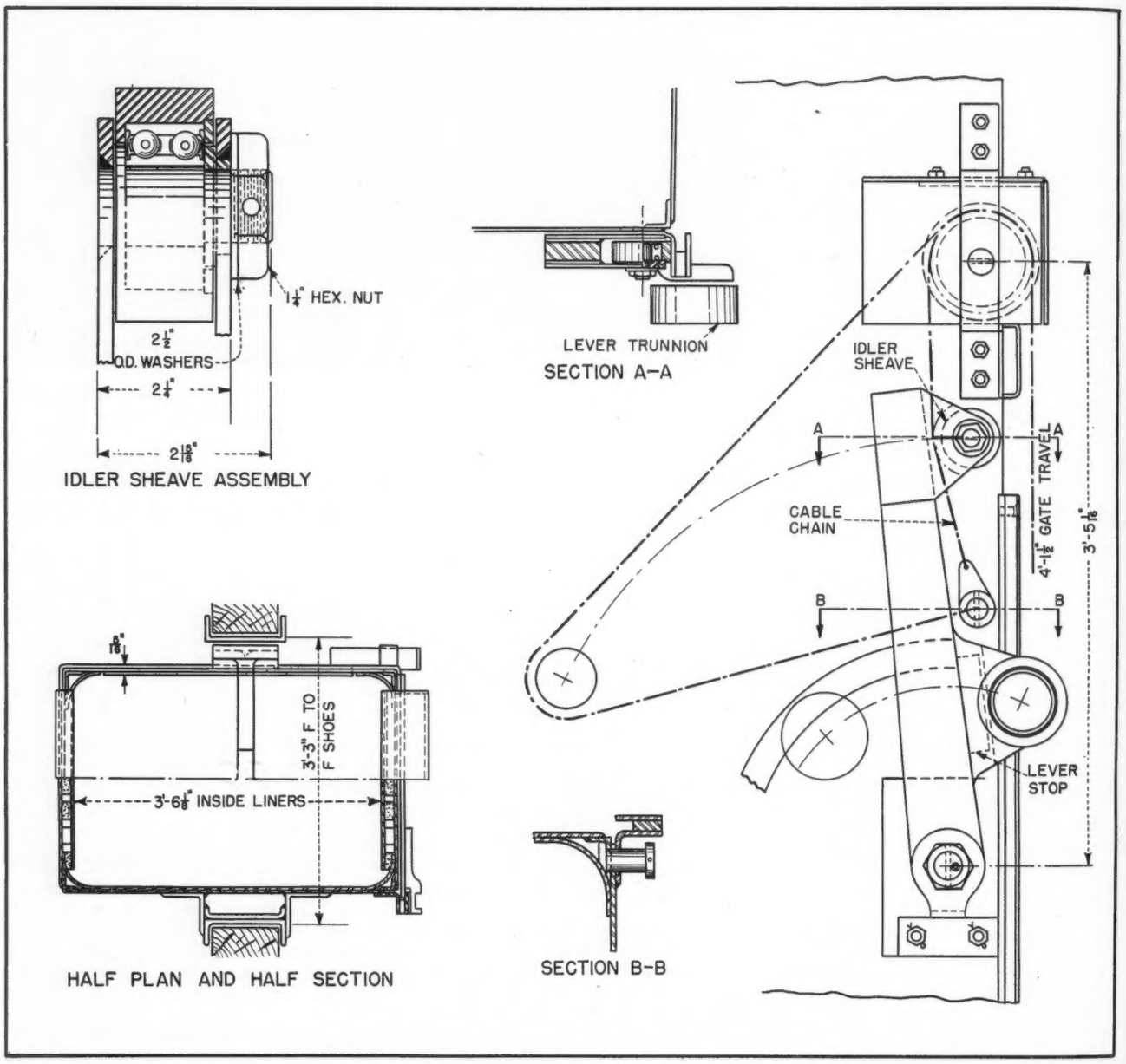
An extensive program of diamond drilling is also being carried on by Republic in iron ore properties idle for 40 years, this in a 10-sq. mi. area northeast of Antwerp, N. Y., and straddling the St. Lawrence County-Jefferson County line. Included in the area are the Caledonia and Old Sterling mine properties.

Though both the Caledonia and the Old Sterling properties were worked for many years, the extent of the potential ore deposits has never been determined accurately. Republic is doing extensive diamond drilling to develop more accurate data.

The Caledonia mine was first opened about 1812 and operated intermittently for almost a century. It was last worked in 1907, when it closed partly

(*Continued on Page* 152)

OPERATING IDEAS



Automatic Bottom-Dump Skip

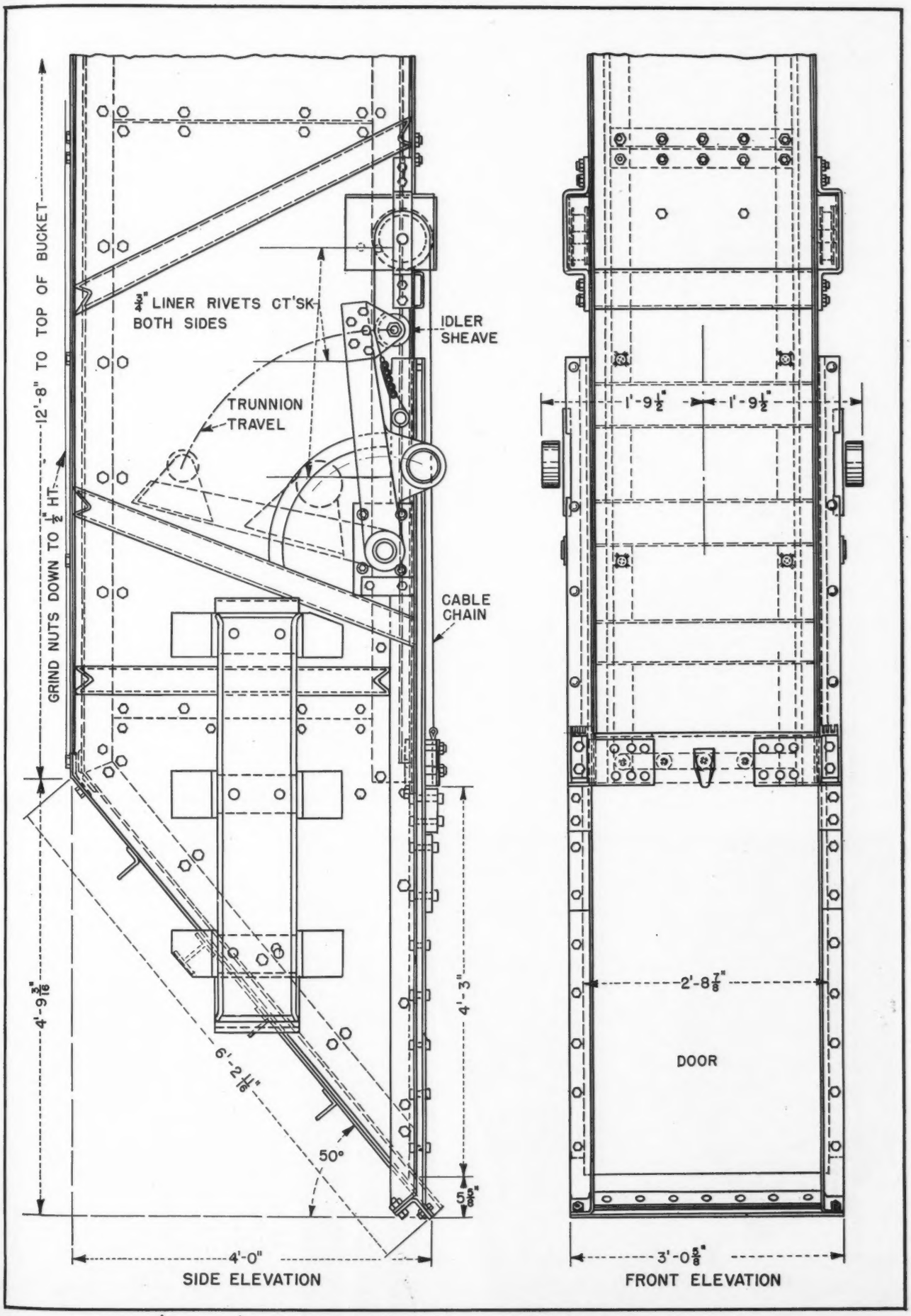
The automatic bottom-dump skip shown here is standard equipment at mines of Anaconda Copper Mining Co., Butte, Mont. It is an improved model of a unit evolved several years ago, and through its use ore hoisting has been speeded up considerably, particularly at the Emma mine, where a low headframe prevented the installation of conventional self-dumping equipment. Since installation of bottom-dump skips, tonnage hoisted per day has been increased about 60%.

The dumping mechanism used on earlier skips was semi-automatic and was controlled by an air cylinder. The hoist engineer stopped the loaded skip at a point above a steel yoke actuated by an air cylinder. Then the skip tender admitted air into the cylinder, thus forcing the yoke into the shaft. Upon lowering the skip, the lugs on the skip door engaged the yoke, holding the door in a stationary position and thereby opening the dumping side of the skip as it fell away from the door.

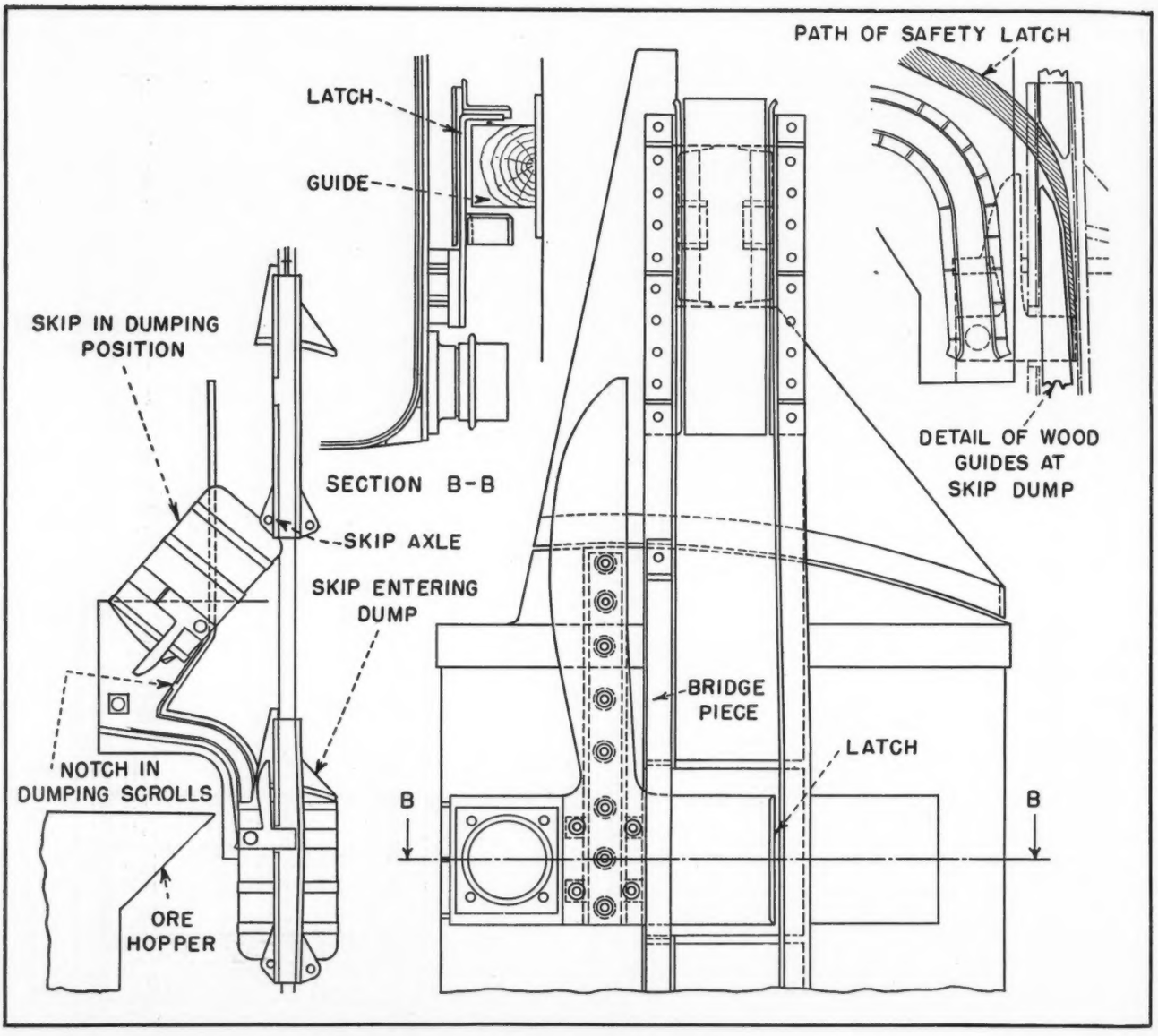
The dump mechanism used on the skips now in operation is of simple design and automatic. It consists of a pivoted steel lever, steel roller, and steel chain, one end of which is attached to the top of the door and the other to the end of the pivoted lever. As the skip is lowered, the roller on the lever enters a steel track, gradually pressing down the lever and thereby opening the door. This mechanism is installed on each side of the skip.

The sides of the skip exposed to the ore flow are protected by a rubber liner installation consisting of a steel liner, backed by a 1-in. rubber lining and ¼-in. duck packing. Weight of the 140-cu.ft. skip is about 9,098 lb.

Automatic Bottom-Dump Skip, continued



GUIDES ENGAGE roller on side which operates lever connected by cable chain to sliding skip door on front of bucket.



Safety Latch For Mine Skips

To prevent self-dumping skips from dumping while traveling in the shaft, safety latches are attached to the sides of skips as shown in these illustrations of an installation built by the Lake Shore Engineering Co., Iron Mountain, Mich. The latch proper consists of a piece of bent ½-in. plate attached to the upper part of the bucket and mounted so that it will slide along the wooden shaft guides if the skip should begin to dump accidentally before it reaches the skip dump. To permit free passage of the latch through the wooden shaft guides and the dumping scrolls at the ore hopper, short sections of the guides and scrolls are cut out as shown. Short bridge pieces on each side of the skip allow the latch to pass side members of the bail.

Exide IRONCLAD BATTERIES

HAVE ALL FOUR VITAL CHARACTERISTICS FOR SAFE, DEPENDABLE MINE HAULAGE SERVICE

1. **HIGH POWER ABILITY** . . . abundant reserve power plus an ability to discharge at high rates.
2. **HIGH ELECTRICAL EFFICIENCY** . . . hence low power costs.
3. **RUGGEDNESS** . . . to withstand hard usage.
4. **LONG LIFE *and* MINIMUM MAINTENANCE** . . . which add up to better service at a saving.

Because of these outstanding qualities, Exide-Ironclad Batteries are used by more mine operators than all other batteries combined.

Most batteries look much alike on the surface. But inside are the differences that determine power, performance and battery life. One notable difference in Exide-Ironclad construction is the positive plate.

THE POSITIVE PLATE consists of a series of slotted tubes which contain the active material (see small illustration at left). So fine are these slots that, while permitting easy access of electrolyte, they retard active material from readily washing out . . . thus assuring years of safe, dependable, day in and day out mine haulage service.

1888—Dependable Batteries for 60 Years—1948

If you have a special battery problem, or wish more detailed information, write:

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32

Exide Batteries of Canada, Limited, Toronto

NEW BOOKS

THE HISTORY OF BASIC METALS PRICE CONTROL IN WORLD WAR II. By Robert F. Campbell, Columbia University Press, Morningside Heights, New York, N. Y. Pp. 263. Price, $3.25.

Restricted almost solely to its stated subject, this book covers thoroughly and objectively the methods, the standards, the actions, and the results of wartime control of the prices of steel, copper, lead and zinc.

As we in the industry well know, control of these prices was the most successful of all the OPA operations. Chart I in the book shows that base metal prices remained virtually unchanged from early 1941 through 1944, and increased only slightly in 1945 . Wholesale prices, on the other hand, increased from 107 to 140 in the same period. (1939 prices equalled 100.)

The author attributes this success largely to:

1. The degree of concentration existing in many of the metals industries.
2. The simplicity and uniformity of the products.
3. The ability of the steel industry to absorb cost increases through operation at high levels.
4. The success of the Premium Price Plan in stabilizing prices of copper, lead and zinc.

Earnings of the metals industries were maintained at about 250% of 1939 earnings between 1941 and 1944, declining slightly in 1943 and 1944. Production declined after 1943, due to manpower shortages and the greater emphasis of production controls on finished war material. Stability of prices did not appear to have noticeable effect on rates of production.

Jesse L. Maury

MOLYBDENUM: STEELS, IRONS, ALLOYS. By R. S. Archer, J. Z. Briggs, and C. M. Loeb, Jr. Published by Climax Molybdenum Co., 500 Fifth Ave., New York 18, N. Y. Pp. 391. Price, free to interested persons.

The varied applications of molybdenum as an alloying element are described in this book, which covers a wide range of materials from wrought to cast steels, and from cast iron to non-ferrous alloys. The major emphasis has been placed on the presentation of the fundamentals that must guide all engineers, designers and metallurgists in their selection of the most suitable materials for a given application.

Considerable recent information is included, not only on the more prominent developments, such as gas turbine (high-temperature) steels and alloys; but also on the work that has served to clarify the factors affecting the service life of the lower-alloy steels. The references to current literature are adequate to facilitate further reading by anyone interested in the subject.

SKINNER'S MINING YEAR BOOK —1948. Compiled and published by Walter E. Skinner, 20 Copthall Ave., London, E. C. 2, England. Price, $7.00.

This is the 62nd. annual issue of this reference work on the mining industry. Complete particulars are given concerning 860 mining companies operating in all parts of the world, with chief emphasis on United Kingdom operations. Data on each company includes: names of directors, operating officials, operating results, description of plant and property, capital, dividends and financial results. The many changes that have taken place during the past year are recorded. Other features are: maps, statistical tables, supplementary index and a buyers' guide.

TRENDS IN ENGINEERING EDUCATION. By James Kip Finch. Published by Columbia University Press, Morningside Heights, New York, N. Y. Pp. 140. Price, $2.00.

America's engineering schools are turning out "tens of thousands of young men, many of whom are being educated either beyond their capacities or below the top needs of the profession," in the opinion of James K. Finch, Dean of Columbia University's School of Engineering.

The statement appears in Dean Finch's book, *Trends in Engineering Education*, which is an analysis of the problems currently facing engineering schools. One of these problems is the move to broaden engineering curricula to include the basic subjects of a general education. Another is the necessity of advancing both the fundamentals and the applications of engineering science. Dean Finch describes in detail the pioneering work on these problems carried on at Columbia since 1914.

INDUSTRIAL AIR SAMPLING AND ANALYSIS. By Leslie Silverman. Published by Industrial Hygiene Foundation, 4400 Fifth Ave., Pittsburgh 13, Pa. Pp. 72. Price to non-members, $1.50.

Latest developments in sampling working-place air to detect health hazards and impurities are outlined in this new bulletin, issued by the Industrial Hygiene Foundation to its member companies. The author is professor in the Harvard School of Public Health, and his work comprises a handbook and reference manual covering routine sampling and control of atmospheric air contaminants.

GOLD MINING ON THE WITWATERSRAND. By C. Biccard Jeppe, De Beers professor of mining engineering and surveying, University of Witwatersrand. Published by the Transvaal Chamber of Mines, Johannesburg, South Africa. Two volumes. Pp. 1821. Price 105s.

Professor Jeppe's comprehensive review of Witwatersrand mining practice might well be regarded as a set of textbooks in which each phase of mining is discussed as follows: (1) Analysis of basic principles, (2) application of these principles to Witwatersrand mining practice, and (3) detailed examples of such practice. With the help of technical associates, and the Transvaal Chamber of Mines, Prof. Jeppe has compiled a complete collection of data, drawings, tables and discussions which will prove valuable for reference work for a long time to come. Readers who are inclined to regard their own country or local mining district as the fountainhead of advanced technology will find it very profitable to study the progressive ideas which have been inaugurated or developed in the Witwatersrand district. For example, this area has done outstanding work in sinking and constructing circular and elliptical shafts. They have also excelled in pouring concrete in shaft installations.

Some statements made in the text will surprise the average reader. For instance, this one—"Stopers are much favoured in many parts of the world for conditions in which it is difficult to rig mounted machines. Two or three decades ago they were commonly used on the Witwatersrand, especially for box holes, but they have been almost entirely replaced by jackhammer machines. . . . Experiments have indicated that though water fed, and using hollow drill steels, stopers produce more dust than ordinary drills. Tappet machines also have been found in general to have a slower drilling speed than ordinary hammer machines."

In general, the first volume is devoted to major mining activities, including exploration development and exploitation. The second volume covers underground and surface mine plants, and concludes with health, safety and labor relations.

KEY FEATURES OF A COMPLETE STEEL SERVICE

Some types still short, but over-all stocks in 13 Ryerson plants are probably the nation's largest.

Prompt personal steel service on all orders, large or small, is a Ryerson tradition.

Accurate cutting to your order is assured by modern Ryerson equipment.

Over a Century of steel experience means more know-how applied to your steel problems.

You get quick delivery anywhere, because the network of Ryerson plants stretches from coast to coast.

PRINCIPAL PRODUCTS

BARS—carbon & alloy, hot rolled & cold finished
STRUCTURALS—channels, angles, I & H beams, etc.
PLATES—sheared & U. M., Inland 4-Way Floor Plate, etc.
SHEETS—hot & cold rolled, many types & coatings
TUBING—seamless & welded, mechanical & boiler tubes
STAINLESS—Allegheny metal sheets, plates, bars, tubes, pipe, etc.
REINFORCING—bars & accessories, wire mesh, etc.
BABBITT—and phenolic laminated bearing material
MACHINERY & TOOLS—metal working & boiler shop

Added Ryerson service includes a chart to guide heat treating sent with alloy shipments.

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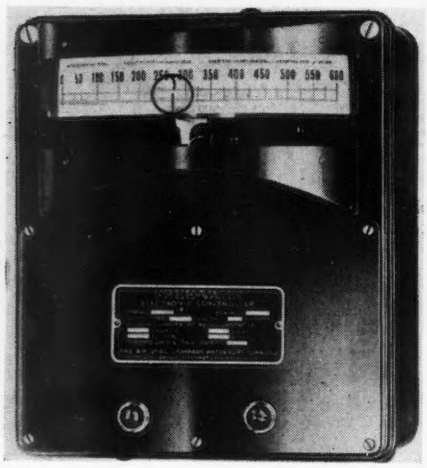
Joseph T. Ryerson & Son, Inc. Plants: New York • Boston • Philadelphia • Detroit • Cincinnati Cleveland • Pittsburgh • Buffalo • Chicago • Milwaukee • St. Louis • Los Angeles • San Francisco

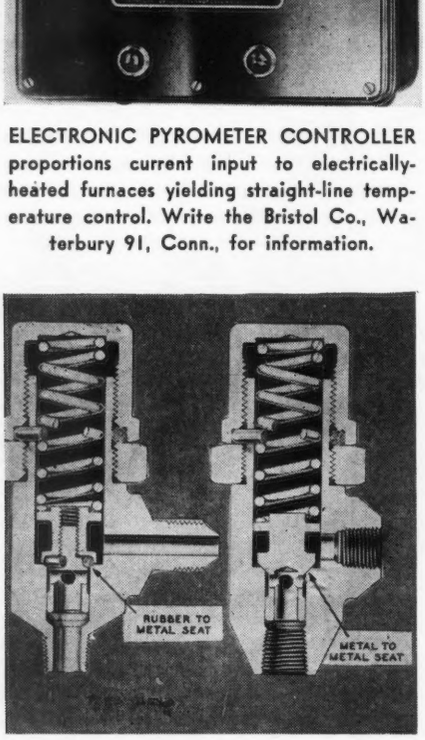
EQUIPMENT NEWS



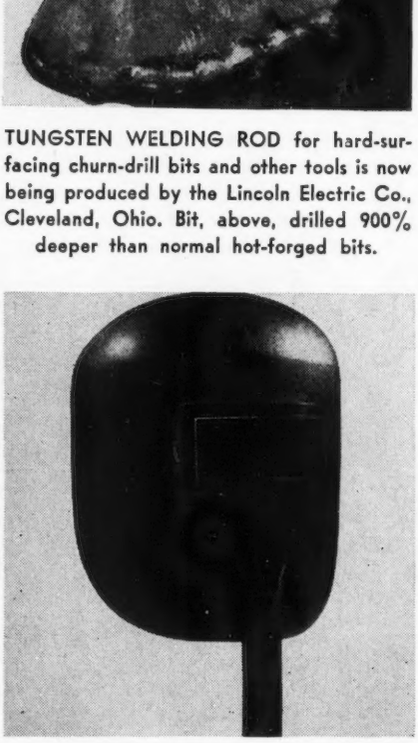
ELECTRONIC PYROMETER CONTROLLER proportions current input to electrically-heated furnaces yielding straight-line temperature control. Write the Bristol Co., Waterbury 91, Conn., for information.

TUNGSTEN WELDING ROD for hard-surfacing churn-drill bits and other tools is now being produced by the Lincoln Electric Co., Cleveland, Ohio. Bit, above, drilled 900% deeper than normal hot-forged bits.

AIR FLOW CALCULATOR for Norblo dust collectors (centrifugal, automatic or standard bag types) may be obtained by writing to the Northern Blower Co., 6409 Barberton Ave., Cleveland 2, Ohio.

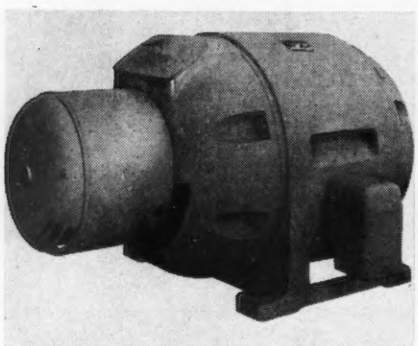


HYDRAULIC AND PNEUMATIC RELIEF VALVES. A new series of valves, shown above, for pressures ranging from 0 to 450 psi. is announced by Parker Appliances Co., 17325 Euclid Ave., Cleveland 12, Ohio.



LIGHTWEIGHT WELDING HAND SHIELD, recommended for operations where a welding helmet is not practical, announced by American Optical Co. Southbridge, Mass. Without glass, assembly weighs 11 oz.

FIVE NEW POWER PLANTS in the industrial engine field, available in 4, 6, and 8-cylinder models are announced by the Ford Motor Co., Dearborn, Mich. The engines have high power per pound ratios.



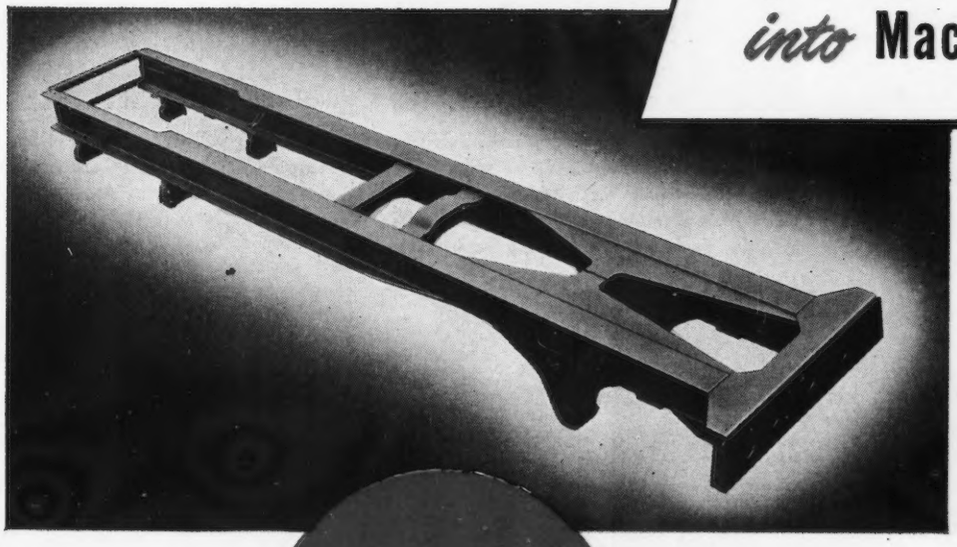
NEW TRI-CLAD LINE of synchronous motors and generators is announced by General Electric, Schenectady 5, N. Y. Motor sizes range from 20 to 1,000 hp. Write for GEA-5113 (motors) and GEA-5125.

LARGE RUBBER HOSE. What is believed to be the longest rubber hose of large diameter, is shown here at the Passaic, N. J., plant of Raybestos-Manhattan, Inc., Manhattan Rubber Division. The 25-ft. sections of 18-in. flexible rubber pipe will be used to carry slurry through a tunnel at a large southern chemical plant. One length of the rubber hose shown above weighs approximately 1,425 lb. with flanges attached.

30-Ton Payloads are hauled with unfaltering ease over the toughest terrain on Mack's Model LRSW. There's abundant power in its 275 h.p. diesel engine. Positive traction because of its Balanced Bogie and exclusive Power Divider. Safe and sure control through hydraulic power steering, air-assisted clutch, air-actuated brakes, short turning radius and offset driver's seat.

You get more work *out* of Mack Trucks

because...we put more work *into* Macks



Massive ruggedness, unrivalled in the truck field, stands clearly revealed in the Model LRSW frame. Electrically welded into one piece, it combines brawny cross members, ample gusseting, and huge reinforced I-beam side members of alloy steel, 13-11/16" deep with 8" flange.

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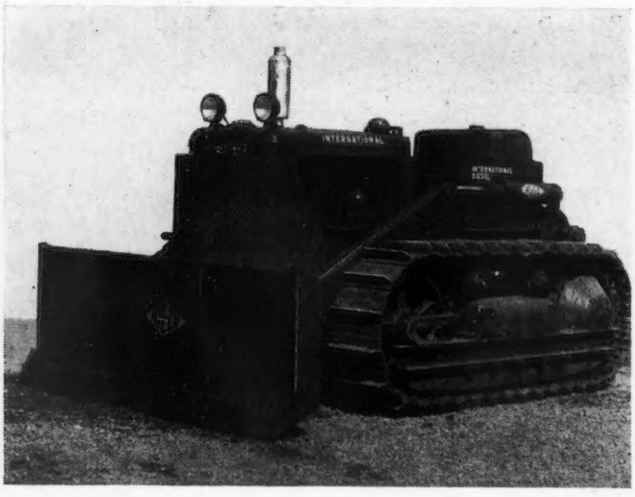
trucks for **every purpose**

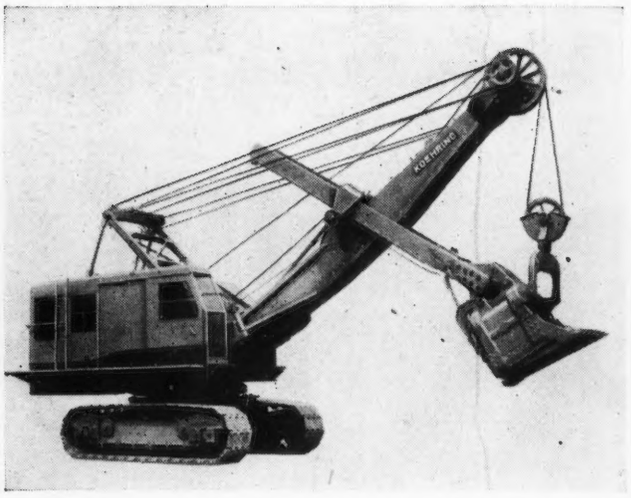
6588

SINCE 1900, AMERICA'S HARDEST WORKING TRUCK

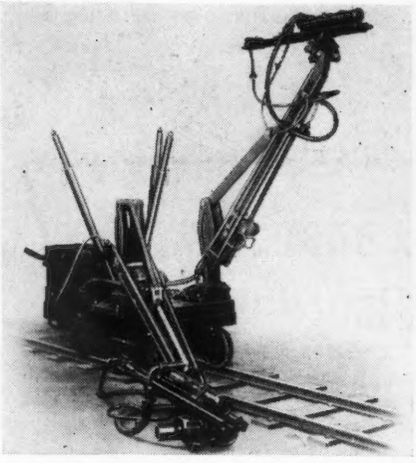
Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.



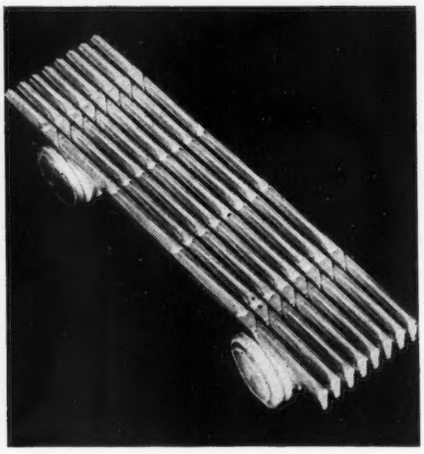
NEW INSIDE-MOUNTED DOZER, now being manufactured by American Tractor Equipment Corp., Oakland, Calif., for International tractors, eliminates track brackets and bell cranks to improve vision, and loose-fitting outside parts which catch brush.



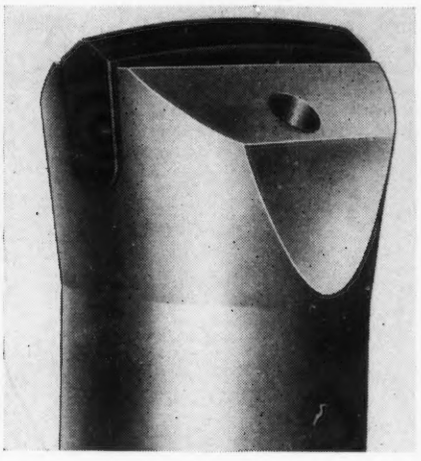
NEW 2½-YD. EXCAVATOR is announced by Koehring Co., Milwaukee 10, Wis. The Model 1005 shown above features a powerful two-section chain crowd, self-equalizing 37-in. retract clutch, and 45-in. boom-point sheave to save wear on wire ropes.



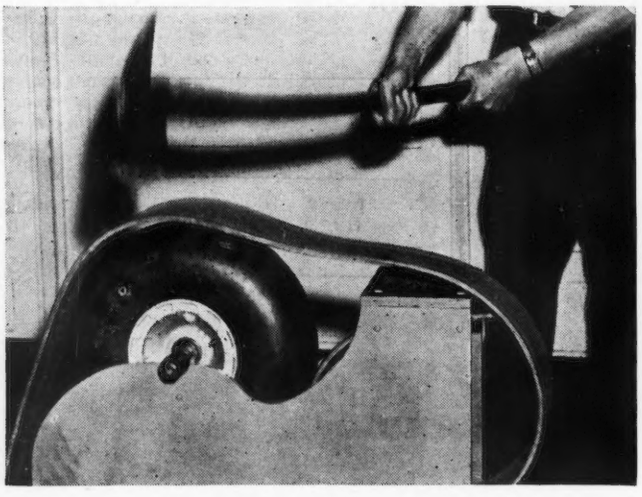
NEW BOOM-TYPE JUMBO features air-powered boom. All controls are conveniently located at front end of boom. For further information write to Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.



WEDGE-WIRE SCREENS are now offered to the mining industry by Cambridge Wire Cloth Co., Cambridge, Md. Screens are made of wedge-shaped wires and are suitable for dewatering, classifying equipment.



NEW CEMENTED CARBIDE CHISEL BITS in sizes of 1⅜ in. to 2¼ in. are now offered to the mining industry by Kennametal, Inc., Latrobe, Pa. Inserts are held in place mechanically.



Why Conveyor Belts Should be Cushioned

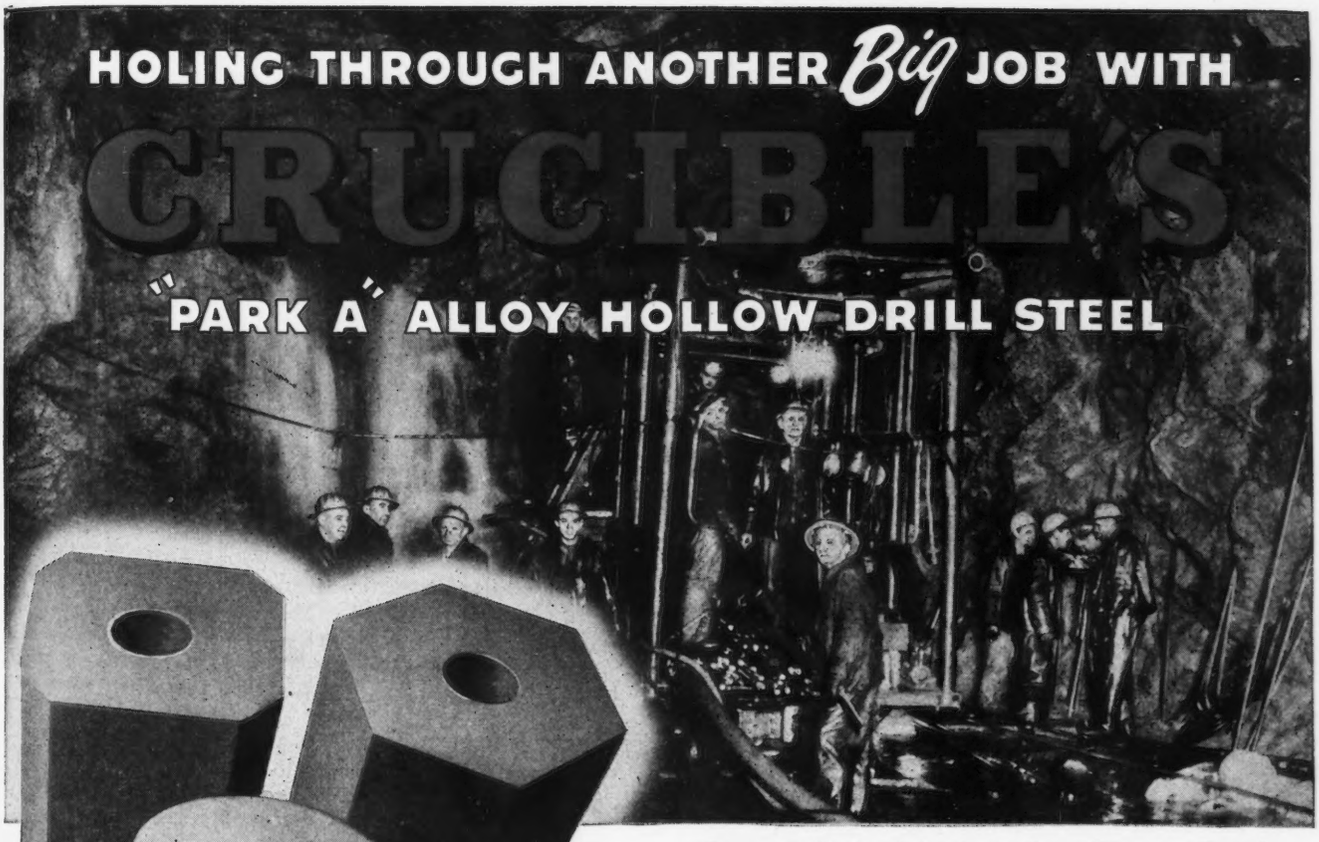
Sales engineer for Goodyear Tire & Rubber Co., Akron, Ohio, demonstrates how a fireman's ax will rebound if used to strike a section of conveyor belt cushioned by a pneumatic tire.

. . . And What Happens if They Are Not

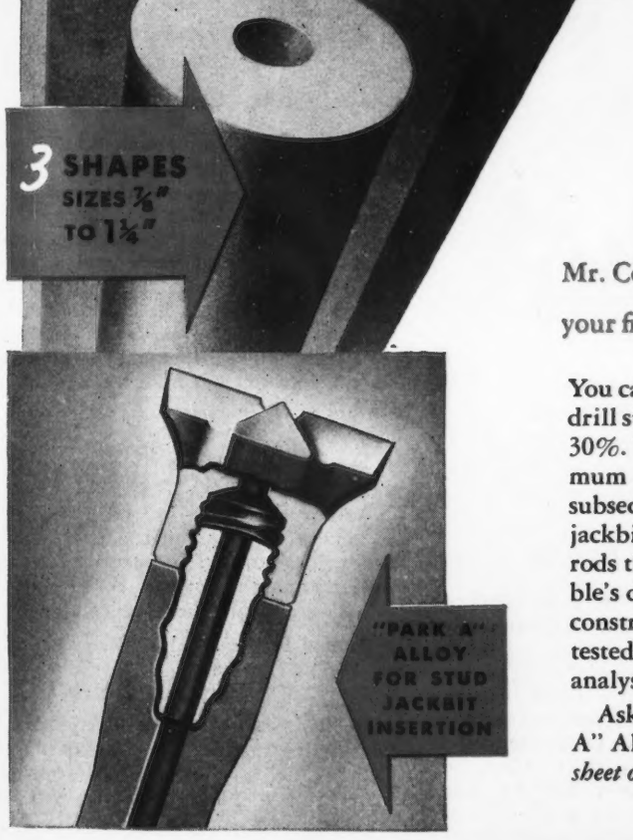
Just as the ax cuts the belt to ribbons when not cushioned, so also will falling jagged rocks shorten the life of conveyor belts lacking proper protective cushion support.

HOLING THROUGH ANOTHER *Big* JOB WITH CRUCIBLE'S

"PARK A" ALLOY HOLLOW DRILL STEEL



Removing final rock barrier in Cresta Diversion Tunnel on Feather River Power Project of Pacific Gas and Electric Company. Drilling under full head of air with "Park A" hollow drill steel and stud jackbits. T. E. Connolly, Inc., San Francisco, California, Contractor.



Cuts Cost of Steel over 30%

Mr. Connolly says, "All the comment I have to offer is that your figure of 30% saving is plenty on the conservative side."

You can save money by using Crucible's "Park A" Alloy hollow drill steel. Tests show that steel costs, alone, can be cut more than 30%. "Park A" Alloy lasts longer under impact; permits maximum drill speeds; enables use of smaller section of steel with subsequent lighter weight; meets I-R Specification 139 for stud jackbit insertion; and can be used for any other detachable bit rods that do not require threading for bits. For 50 years, Crucible's drill steels have been making more hole for less money in construction, mining, and quarrying. All are inspected and tested before shipment for resistance to fatigue, uniformity of analysis and structure, stiffness, and accuracy of section.

Ask your Crucible CRUSCA drill steel salesman about "Park A" Alloy hollow drill steel. *Write for your copy of the new data sheet on Crucible's "Park A" Alloy hollow drill steel.*

CRUCIBLE STEEL Company of America

"FULL-RANGE" QUALITY STEELS for INDUSTRY

HIGH SPEED · TOOL · STAINLESS · ALLOY · MACHINERY · SPECIAL PURPOSE STEELS

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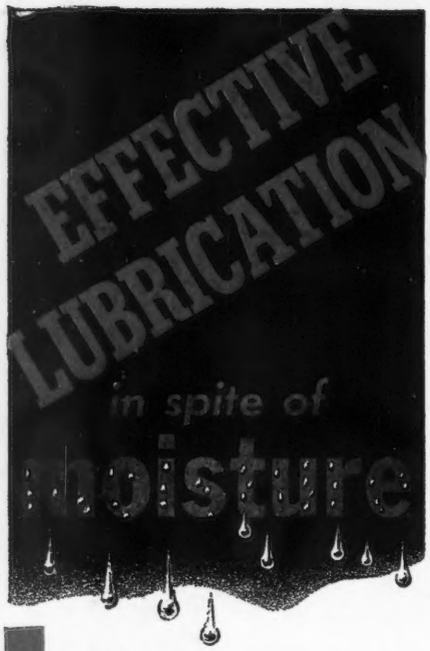


Operation of production machinery in the presence of moisture, steam and acids has always been a serious problem in many processing industries. There are a number of LUBRIPLATE lubricants that satisfactorily meet these unfavorable operating conditions, thereby protecting machine parts against rust and corrosion. Write for interesting particulars.

LUBRIPLATE

Lubricants definitely reduce friction and wear to a minimum. They lower power costs and prolong the life of equipment to an infinitely greater degree. LUBRIPLATE arrests progressive wear.

LUBRIPLATE

Lubricants protect machine parts against the destructive action of rust and corrosion. This feature alone puts LUBRIPLATE far out in front of conventional lubricants.

LUBRIPLATE

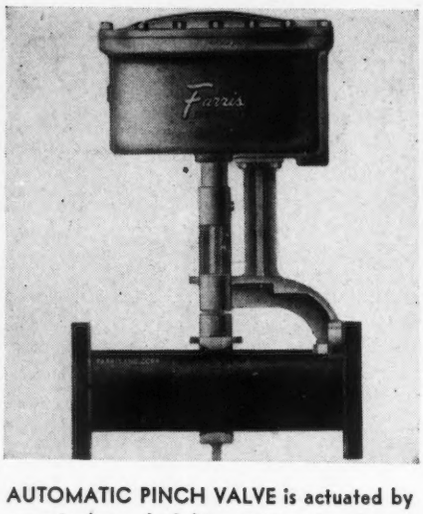
Lubricants are extremely economical for reason that they possess very long life and "stay-put" properties. A little LUBRIPLATE goes a long way.

LUBRIPLATE

FISKE BROTHERS REFINING CO.
NEWARK 5, N. J. TOLEDO 5, OHIO

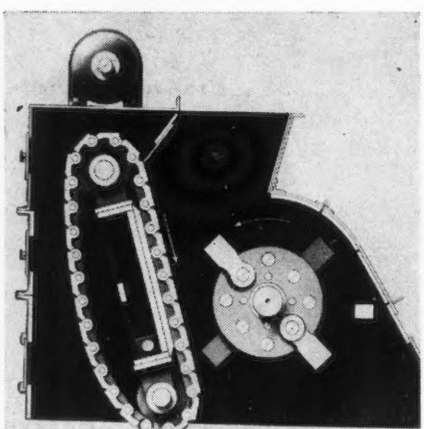
DEALERS FROM COAST TO COAST
CONSULT YOUR CLASSIFIED TELEPHONE BOOK

EQUIPMENT NEWS (*Continued*)



AUTOMATIC PINCH VALVE is actuated by a springless, dual-drive piston insuring a uniform stroke. This new series of pinch valves is manufactured by Farris Engineering Corp., Pallisades Park, N. J.

INDICATING AND CONTROLLING PYROMETER of the thermocouple type useful for oven, kilns and furnaces is manufactured by Assembly Products, Inc., Main and Bell Sts., Chagrin Falls, Ohio.



NEW MUD-HOG crusher for wet, sticky material made by Jeffrey Manufacturing Co., Columbus 16, Ohio, has adjustable breaker plate driven by separate gear-head motor through chain and sprocket.

Wire for Wet Places

A new electrical wire with rubber insulation that improves when soaked with water has been developed by the United States Rubber Co. The new wire, called "Laytex RUW" is designed for use underground and in places where moisture resistance is required. In one test insulation resistance rose from 500 to 2,400 megohms per 1,000 ft. after the wire had been immersed in water for 24 weeks at 122 deg. F.

Mobile Gas Turbines

Allis Chalmers engineers are now developing mobile gas turbine plants which will be mounted on railroad trucks for ready transportation. The turbines will not require water. Units of 3,000 and 6,000 kw. are considered feasible. The prime mover of the contemplated 3,000-kw. unit will operate on the simple gas turbine cycle with regenerator, and will be coupled to a 3,600 rpm. generator.

New Hose Connection

A new swivel connection that eliminates twisting and kinking of hoses carrying air and water has been perfected by Dixon Valve & Coupling Co., Philadelphia, Pa. Construction consists of two metal parts and a synthetic rubber gasket. The connection remains tight and leakproof under normal working pressures. Sealing is effected by the gasket which is designed to expand as increased pressure is applied.

INDUSTRIAL NOTES

Arthur B. Palmer has been appointed general manager of the **Sperry-Sun Well Surveying Co.**, according to a recent announcement by **S. H. Williston**, vice president of the company.

Harold F. Smiddy has been appointed general manager of the chemical department of **General Electric Co.**

W. H. Shank has been appointed advertising manager for the **Hardinge Co., Inc.** He succeeds **R. C. Ferguson**, who is now North Central district manager.

William Hulse is now associated with the **Foote Mineral Co.** as service engineer.

William Brunkala is now on **Stearns Magnetic** technical staff at Milwaukee, Wis.

M. J. Sayers, metallurgist for the **Galigher Co.**, has recently completed

(*Continued on p.* 115)

INDUSTRIAL NOTES

(Continued)

16 months of consulting work on the Island of Cyprus, and has left for Potrerillos, Chile.

George H. Deike, Jr., has been appointed secretary of **Mine Safety Appliances Co.**, and **C. P. Rooney** as assistant treasurer. Mr. Deike will also continue as chief engineer of the company.

Don G. Savage, general sales manager of the **Thew Shovel Co.**, Lorain, Ohio, died July 25.

BULLETINS

Diesels for Power and Open Pits. Caterpillar Tractor Co., Peoria 8, Ill., has issued Form 11620 which illustrates the use of diesel power for shovels, draglines, cranes, compressors, locomotives, etc. Form 11460, entitled "Working the Open Pits" may also be requested.

Sand and Gravel Pumps. Kansas City Hay Press Co., Kansas City 6, Mo., has released a folder describing and illustrating the Lightning sand and gravel pump. Exploded views and engineering data are included.

Hard Surfacing Electrodes. Page Steel & Wire Division, American Chain & Cable Co., Inc., Monessen, Pa., announces a new booklet, DH-45, giving complete information on Page hard-surfacing electrodes.

Swing-Hammer Crusher. Jeffrey Manufacturing Co., Columbus 16, Ohio, has issued Bulletin No. 811 which describes, illustrates, and lists specifications for the swing-hammer type "Mud Hog" crushers.

Radioactivity Detectors. Three models of portable radio activity detectors ranging in price from $150 to $195 are shown in a recent bulletin issued by the Geophysical Instrument Co., 1820 N. Nash St., Arlington, Va.

Metallurgical Products. General Electric Co., Chemical Dept., Pittsfield, Mass., has released Bulletin No. CDM-12 describing G.E. metallurgical products including cast and sintered Alnico, Cunife, Cunico, Vectolite, Silmanal and various permanent magnet holding assemblies.

Permanent Roofs. "One Metal Roof for the Life of Your Building" is the title of a 24-pg. booklet available from the International Nickel Co., Inc., 67 Wall St., New York 5, N. Y. Full data is presented on a soft-temper Monel roofing sheet.

Large Induction Motors. Electrical characteristics, full-load power factors, and approximate range of starting torques for squirrel-cage induction motors larger than 200 hp. are charted in Bulletin 05B6132A available from Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Dial Scales. The Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa., announces the following bulletins: P-714G, Counting Scales; P-714D and P-714F, Portable Platform Scales; P-714C, Dormant Platform Scales; and P-714K, Cranes Scales.

Permanent Magnetic Separators. Write to Eriez Mfg. Co., 182 E. 12th St., Erie, Pa., for a copy of Catalog No. 12 which describes and illustrates permanent magnetic separators. Ample specifications and engineering data are included.

Stainless Steel. Bulletin 51 of the Jensen Machinery Co., Inc., Bloomfield, N. J., describes facilities of the company for designing and manufacturing stainless-steel custom-built equipment for all industries.

Pillow Blocks. SKF Industries, Inc., announces a 76-page combined catalog and engineering guide for pillow-blocks installations which may be obtained from any of the company's 19 district offices.

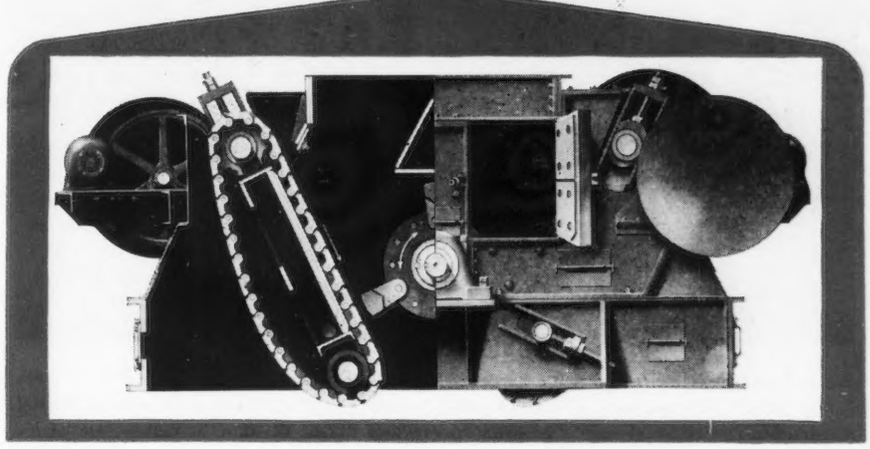
Filing Room Tools. E. C. Atkins and Co., saw manufacturers, Indianapolis, Indiana, offers a new 60-page booklet "Tools for the Filing Room."

Announcing a

REVERSIBLE

Traveling Breaker Plate

SWING HAMMER CRUSHER



● NOW . . . Swing Hammer crushers with traveling breaker plate—designed for handling wet, sticky clay, ores, limestone, etc. No building up at any point—no plugging of machine.

42″ x 50″ Reversible size Weight—approx. 30 tons
Maximum feed—40″ square x 18″ thick

Both traveling breaker plates are adjustable—are driven individually by gear head motors. Possible to run one size of product on one side of machine—to obtain another size by simply reversing the rotor.

This same crusher built in 36″ x 24″ size but non-reversible. The two machines make it possible to use large one as primary unit, the smaller for secondary crushing or smaller capacities. Write for more detailed information.

CONVEYORS • BUCKET ELEVATORS
FEEDERS • CAR PULLERS • CRUSHERS
CHAINS AND TRANSMISSION MACHINERY

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Birmingham 3 · Cincinnati 3 · Harlan · Milwaukee 2 · St. Louis 3
Boston 16 · Cleveland 13 · Houston 5 · New York 7 · Scranton 3
Buffalo 2 · Denver 2 · Huntington 19 · Philadelphia 3 · Salt Lake City 1

PERSONAL NEWS

James Boyd (right), director of the Bureau of Mines and president of the Joseph A. Holmes Safety Association, presents a special safety award and Certificate of Honor to Daniel Harrington, retired chief of the Bureau's Health and Safety Division, in recognition of his many years' service in the promotion of health and safety in the mineral and allied industries. Mr. Harrington is the third person to receive this special award since the formation of the association in 1916.

C. W. Plumb has been appointed general manager of the Eureka Mining Co., Sutter Creek, Calif.

Dan Cavanagh of Twin Falls, Idaho, and **Col. Leo J. Leeburn** of Boise, Idaho, have been named directors of the Gateway Gold & Copper Co., according to **D. A. Campbell**, president. The company has started operations on the Dewey mines near Stibnite.

Dr. George Sachs has been appointed the first director of the recently established National Metallurgical Laboratory, located in Jamshedpur, India. This laboratory, one of five new governmental research laboratories in India, will carry on research work on ores, minerals and refractories. Dr. Sachs is director of the Research Laboratory for Mechanical Metallurgy and professor of physical metallurgy at the Case Institute of Technology in Cleveland, Ohio.

Lyle E. Shaffer of Rollo, Mo., has resigned as instructor at the Missouri School of Mines to become a member of the staff of the South Dakota School of Mines & Technology.

C. D. Anderson has been appointed purchasing agent for the Mesabi range mines of the Cleveland Cliffs Iron Co. His headquarters will be at Taconite, Minn.

Alden Steffens, Houghton, Mich., mining engineer, is a new member of Pickands, Mather & Co.'s engineering staff at Hibbing.

Charles E. Prior, representative in Europe, Africa and the Near East for the mining department, American Smelting & Refining Co., returned to London recently after an extended trip to central, eastern and southern Africa.

Thomas F. Kearns, Salt Lake City, has been named president of Silver King Coalition Mines Co. to succeed the late **David Keith. David Keith, Jr.** has been elected to the directorship left vacant by the death of his father July 9.

William J. Fene has been appointed assistant chief of the Health and Safety Division of the Bureau of Mines. He succeeds **John J. Forbes,** who became chief of the Health and Safety Division upon the recent retirement of **Daniel Harrington. Mr.** Fene has been associated with the Bureau for more than 28 years.

Henry C. Adami, chief chemist for the Federal Mining and Smelting Co. and identified with mining in the Coeur d'Alene area in Idaho since 1901, retired Aug. 1.

Max Barash resigned as chief counsel of the U. S. Geological Survey, Aug. 30, to enter private practice of law in Washington.

A. H. P. Moline has retired as general manager of Mt. Lyell Mining & Railway Co., Ltd., Tasmania. **Hugh Murray,** assistant general manager has been appointed to take his place.

Robert Gross, superintendent of M. A. Hanna Co.'s Douglas iron mine, Chisholm, Minn., on the Mesabi, has been transferred to the Mississippi group at Keewatin. **Leo Kruse,** superintendent of the Spring Valley operations, Fillmore County, replaces him as superintendent of the Douglas mine.

R. S. Walker, consulting engineer for M. A. Hanna Co. recently returned to Cleveland from England.

Campbell Shaw, formerly metallurgist of Golden Horse Shoe (New) Ltd., Kalgoorlie, Western Australia, has been appointed general manager of the company to replace **J. E. Ede,** who has retired.

Paul S. Allsman, son of **Paul T. Allsman,** chief of the mining division, U. S. Bureau of Mines, has been awarded a $750 one-year scholarship by Kennecott Copper Corp. for outstanding work as a third-year student in the University of Utah College of Mines and Metal Industries.

K. A. Rowell has been appointed assistant general superintendent of mines and quarries, Broken Hill Proprietary Co., Ltd., Australia.

E. J. Langevad, previously in charge of diamond drilling at Roan Antelope Copper Mines, Ltd., Northern Rhodesia, has been appointed exploration engineer for the Electrolytic Zinc Company of Australasia, Ltd. at Rosebery, Tasmania.

Dr. G. K. Williams, works manager of the smelters of Broken Hill Associated Smelter Pty. Ltd., Port Pirie, South Australia, has been appointed consulting metallurgist to Imperial Smelting Corp., England.

Willard H. Dow, president of the Dow Chemical Co., Midland, Mich., has been elected to receive the American Society for Metals' medal for the advancement of research.

William H. Kerns, engineer, has been assigned field work with the U. S. Bureau of Mines in Juneau, Alaska.

Dr. Charles H. Behre, Jr., professor of economic geology, Columbia University, has been granted a year's leave of absence to continue the study of the genesis, distribution and geologic control of mineral deposits of Mexico. During his absence, **Dr. T. S. Lovering** of the U. S. Geological Survey and **Dr. Donald M. Davidson,** consulting geologist of the E. J. Longyear Co., have accepted invitations to lecture.

George A. Freeman, formerly mill superintendent of Coronado Copper & Zinc Co., Dragoon, Ariz., has been named superintendent, as well as a director and secretary-treasurer of the Omega Metals Co. at Kingman, Ariz., recently formed by him and associates. The main work of the company for the present will be carrying on development work at the Copper World mine and the construction of a mill at the Boriana mine.

A. L. Kreamelmeyer, formerly general traffic manager for Eagle-Picher Mining & Smelting Co., has been appointed to succeed **H. A. Gray,** retired, as vice president.

Dr. H. R. Gault, associate professor of geology at Lehigh University, is engaged in work on the economic geology of Bucks County for the Topographical and Geological Survey of Pennsylvania.

RUSSELL J. PARKER

Russell J. Parker, assistant to the president of Kennecott Copper Corp. has been appointed vice president. He will be in charge of the iron and titanium division of the corporation. Mr. Parker recently received the Distinguished Achievement Medal from the Colorado School of Mines for outstanding work in mining exploration.

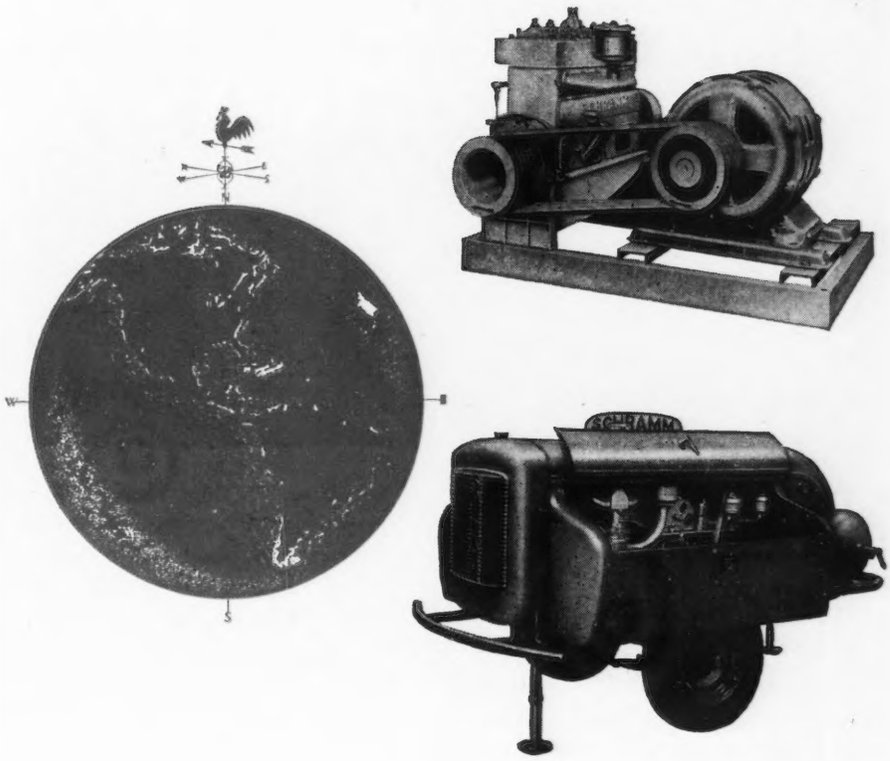
H. Ferrel Anderson, Leslie C. Richards and **Richard N. Spencer** have opened offices in the Palmer building in Baker, Ore. and will specialize in mining and civil engineering work. Anderson is a geologist and mining engineer, Richards formerly was assayer and chemist in the Baker office of the State Department of Geology and Mineral Industries, and Spencer was with the U. S. Bureau of Mines.

Major A. O. Ames, former mines inspector at Yellowknife, Northwest Territories, has formed a partnership with **Al Upton** to carry on mining contracting, with headquarters at Vancouver, B. C.

W. O. Williams has joined the staff of Torbrit Silver Mines, Ltd. at Alice Arm, B. C.

(*Continued next page*)

North • East • South • West . . . It's Schramm



. . . doing jobs like these in Your Field

At almost every turn you need compressed air!

The check list (at right) indicates some of the many compressed air jobs to be done, all of which are accomplished easily, quickly and economically with Schramm Air Compressors.

Here's *why* you profit, as others have, by using Schramm: they're compact, lightweight, easy to start; built for rugged jobs, to provide a continuous flow of air.

Important features include 100% water cooled; mechanical intake valve; forced feed lubrication and easy, electric push-button starting.

Performance everywhere has proved Schramm Air Compressors can do any compressed air job you require. Write today for list of models and sizes.

- Rock Drilling
- Breaking Pavement
- Trench Digging
- Clay Spading
- Sheet Pile Driving
- Backfill Tamping
- Caulking Pipe Lines
- Spray Painting
- Sand Blasting
- Digging Post Holes
- Pneumatic Grease Guns
- Pneumatic Tools
- Spraying Metal
- Spraying Enamel
- Riveting
- Steel Drilling
- Wood Boring
- Scaling
- Chipping
- Caulking Boilers
- Cleaning Boiler Flues
- Cleaning Engine Generators
- Operating Air Hoists

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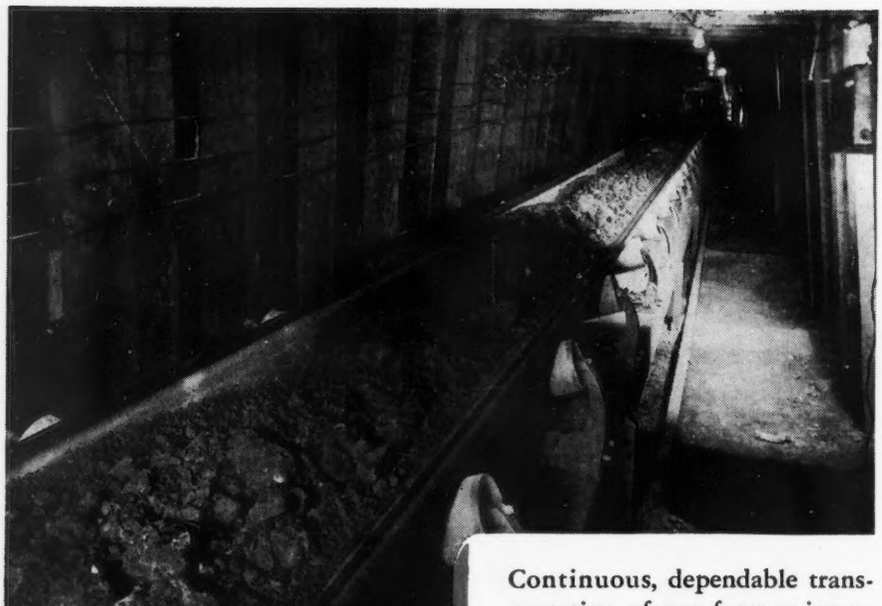


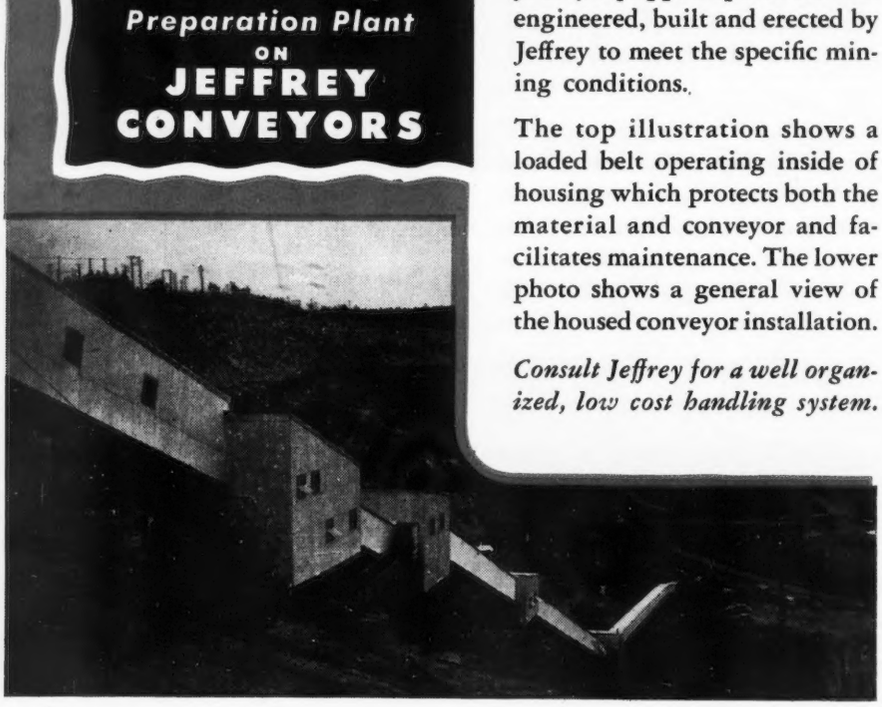
MODERN TRANSPORTATION
From Mine to Preparation Plant
ON
JEFFREY CONVEYORS

Continuous, dependable transportation of ore from mine to preparation plant is most economically handled at this mine with Jeffrey Belt Conveyors.

This installation like most Jeffrey equipped operations was engineered, built and erected by Jeffrey to meet the specific mining conditions.

The top illustration shows a loaded belt operating inside of housing which protects both the material and conveyor and facilitates maintenance. The lower photo shows a general view of the housed conveyor installation.

Consult Jeffrey for a well organized, low cost handling system.



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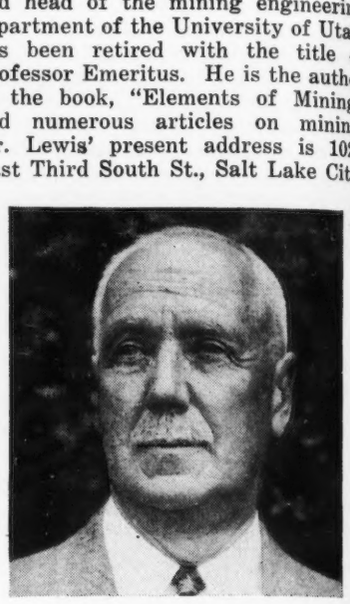
Robert S. Lewis, former professor and head of the mining engineering department of the University of Utah, has been retired with the title of Professor Emeritus. He is the author of the book, "Elements of Mining" and numerous articles on mining. Mr. Lewis' present address is 1023 East Third South St., Salt Lake City.



ROBERT S. LEWIS

Thor Kiilsgaard has been appointed as the first full time geologist of the Idaho Bureau of Mines and has started a survey of the State's old mining camps to determine possibilities of renewed mining development.

John H. Moore has been elected president and treasurer of Marshall-Wells New Jersey Co. Prior to his election, he was executive vice president, treasurer and controller of the company.

Herbert P. Dickey is now associated with Kennecott Copper Corp. at the Montreal office. He was formerly with Hollinger Cons. Gold Mines, Ltd. in Montreal.

Howard G. Wilcox has accepted a position as supervising mining engineer with the Reconstruction Finance Corp. For the past 13 years he has been a member of the faculty of the University of Alaska.

Ralph L. Healy, general manager of Wright-Hargreaves Mines, was recently elected president of the Ontario Mining Association for the current year. He succeeds **A. L. Blomfield,** president and managing director of Lake Shore Mines.

Hans Lundberg, geophysicist of Toronto, is a member of group of six who are making an aerial survey of a million acres of ground in Sweden thought to contain iron and other base metals.

Earl Bebee, superintendent of the Ajax mine at Cripple Creek, owned by the Golden Cycle Corp., has gone to Beaumont, Calif. **C. H. Carlton,** assistant superintendent of the Cresson mine will succeed Mr. Bebee.

Harry A. Shaw, Jr. is associated with Kennecott Copper Corp. at its New York office. He was formerly with the Braden Copper Co., Chile.

J. S. Richards has been appointed acting director, mines branch, the Manitoba Department of Mines and Natural Resources. He has served the department since 1930, first as provincial assayer, and later as administrative assistant to **Dr. G. M. Furnival** whom he succeeds.

Rip V. Thompson has recently been made mill superintendent for the new mill of Metal Producers Co. at Millford, Utah.

John Morrison of Allenby, B. C. has been re-elected president of the Granby Employees' Benevolent Association.

H. C. Enos, mining engineer, of Chatsworth, Calif., has returned to California after examining mines at Lake City, Colo. He is now examining mines near Mojave.

PAUL QUENEAU

Paul Queneau has been appointed metallurgical engineer of the International Nickel Company of Canada, Ltd. Prior to his appointment, he served as research engineer and superintendent of research for the company's mines and plants at Copper Cliff, Ont. **W. K. Sproule**, formerly chief physicist for the Copper Cliff research laboratory, succeeds him.

H. H. Hales has been appointed manager of Sherritt Gordon Mines, Ltd. to succeed **R. C. Brehaut**, retired, who is being retained by the company in a consulting capacity.

OBITUARIES

Harry Brearley, metallurgist, died July 14 in Torquay, England, at the age of 77. In 1916, he discovered stainless steel and during the same year was awarded the Bessemer Medal of the British Iron & Steel Institute.

Joseph E. Perrault, 74, director of Noranda Mines, Ltd. and associated companies, died June 13 in Montreal.

Warren H. Emens, geologist with Mining Corporation of Canada, Ltd., died June 15 at his home at Cannington, Ont. He was 61.

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Personal News *(Continued)*

A TRIBUTE TO ROLLAND CRATEN ALLEN

By M. D. HARBAUGH

Rolland Craten Allen, known affectionately to his many friends as "Bill", died in Cleveland, July 18, 1948, aged 67. Although he had been in ill health nearly two years, he had seemed to be recovering until a setback occurred last spring. Death interrupted many of his plans; a new winter home built in Texas, he had hoped to enjoy in the years ahead, and he had looked forward to the culmination of plans involving various business and other enterprises to which he had given a great deal of thought and effort.

Mr. Allen exemplified the strong character, good sense, high intelligence, broad knowledge and deep social responsibility that characterize those we instinctively consider to be "the salt of the earth". His career is typical of the tradition of America. Self-reliant son of the good old-fashioned country doctor and a fine mother, who implanted in him rugged virtues of hard work, honesty, fairness and determination, which so marked his life, he took off "on his own" in his early teens. His friends have heard with amusement of his youthful experiences as a cheese factory worker and in peddling books, "scopes and views" and a "biblical scroll", through villages and countryside. At the age of sixteen he successfully taught a country school where the previous teacher had been "run out" by the "tough kids". Having never gone to high school, he prepared for college while teaching, and then put himself through the University of Wisconsin by means of odd jobs and an interval of high-school science teaching, graduating in geology in 1905 with high honors. Then followed geological field work in Ontario for Professor Van Hise during the period of his graduate work, until he received an M.S. degree in 1908.

In the fall of 1908 he was appointed instructor in geology at the University of Michigan and the following year became State Geologist of Michigan—the first, incidentally, without a distinguishing beard! As State Geologist, he represented the State in connection with the original appraisal of the iron ore and copper mines of Michigan by J. R. Finlay, and soon thereafter became also the first State Mine Appraiser. As a state official, he won the high regard of the State government, the public and the mining companies, and he made of his office a vital force in the development of the natural resources of the state.

When the Bureau of Internal Revenue, at the time of World War I, needed someone to handle mine taxation which suddenly had become of

tremendous importance, Allen was the logical choice, and he was given leave of absence from Michigan to organize the Natural Resources Division of the War Profits and Excess Tax Board, and he became its first Chief.

In 1919 he came to Cleveland, as vice president of the Lake Superior Iron Ore Association, and was intimately connected with that organization and its varied work until 1947, when he resigned as president because of his health. In 1921 he became affiliated, as mining executive, with the firm of Oglebay Norton & Co., which engages in iron ore and coal mining, lake shipping and various other enterprises, and was made executive vice president in 1924. About this time he was also called to the Joplin district to organize the zinc mining companies into an association, and he devoted part of his time to that district over a period of years. His firm was engaged by the Russian government to advise it on the development of its iron ores, and Allen went to Russia in 1930 and 1931 in that connection.

He had long foreseen the development of iron ore production from "taconite"—the iron-bearing rock of the Lake Superior ranges—and was the organizer and head of Reserve Mining Co. which acquired the large block of magnetic taconite lands of Mesabi Iron Co. and which recently has been engaged in preparations to build a great concentrator and other facilities to bring that property into production. He had hoped to see the culmination of this vast enterprise which he felt would be the most important in his life.

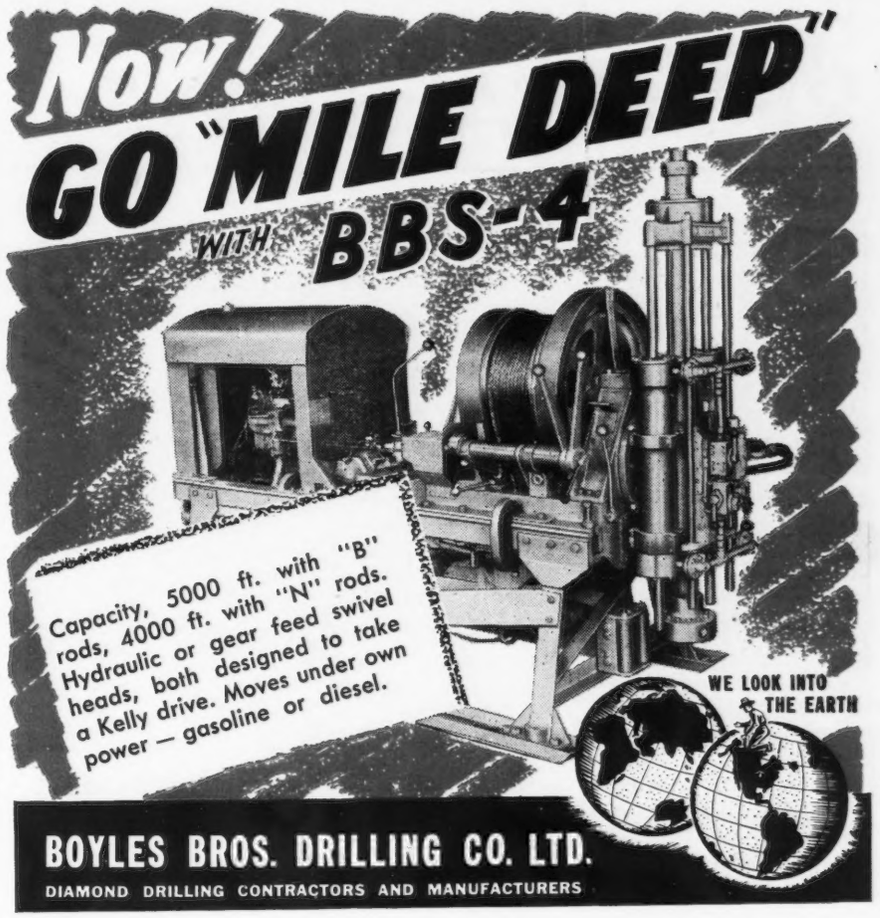
With war in the offing, Mr. Allen was called to Washington in June, 1940, by the Advisory Council for National Defense, to aid in the procurement of strategic minerals for the iron and steel industry. In that and the successive agencies culminating in the War Production Board, he served vigorously until the fall of 1945, being vice chairman of Minerals and Metals of the latter agency when he resigned. He was responsible from the beginning for directing the wartime supply of iron ore, which, incidentally, was done without a single government control order.

He was an active member of numerous geological and other scientific and engineering societies, and served as President of the AIME in 1937. One of his chief interests was Battelle Memorial Institute of Columbus, Ohio, of which he was president and trustee when he died.

Mr. Allen had a way of getting directly at the fundamentals of any problem, of organizing and getting things done. He attracted able assistants who became his friends as well as untiring and admiring workers. His keen thinking and good sense, made him always a most stimulating companion.

The place "Bill" Allen made for

(*Continued on page* 153)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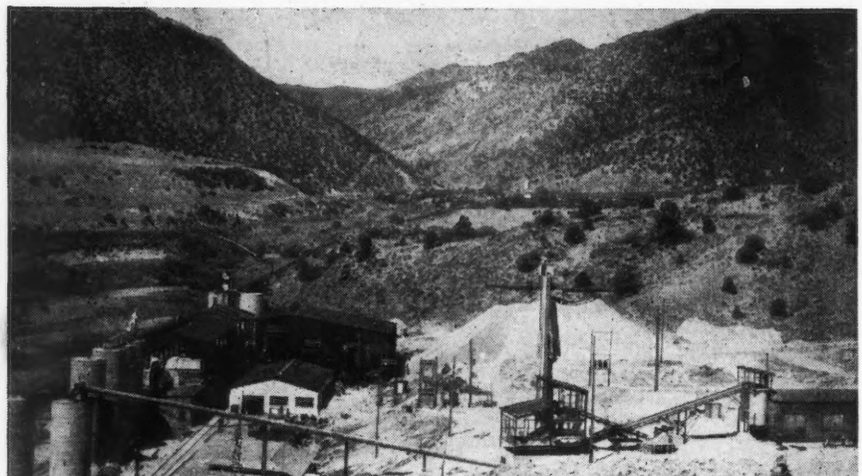
REGIONAL NEWS



FELDSPAR FLOTATION PLANT recently erected by Consolidated Feldspar Corp. at Parkdale, Colo. Feldspar mica and a grade of quartz very low in iron are produced as concentrates by flotation. The plant has about the same capacity as that of the one erected by the company at Kona, N. C., Spruce Pine district, a few years ago. V. L. Mattson is chief engineer.

TRI-STATE

Fringe issues hold up Eagle-Picher settlement—Mill burns at No. 7 mine of American Zinc Co. of Oklahoma

★Tri-State mine operators were well pleased generally with the advent of $95 per ton blende along with an increase of $25.72 per ton in the price of galena on July 28. Hope was expressed by mining men that other considerations of higher costs (increases in wages and supplies) would not swallow up the increase in ore prices and offset the good effect on marginal production prospects. With an upward revision in the smelting charge, from $17.47 to $20.55 a ton, the Eagle-Picher settlement price for lead concentrates on a metal contract basis was established at $257.37 a ton, an increase of $25.72 a ton following the 2c. per lb. rise in the metal quotation to 19.30c., East St. Louis. The advance in the smelting charge was attributed to an increase of $1.75 in labor costs and $1.33 in freight rates that had not been added into the smelting costs over a period of several months.

★August 4 marked the 35th day of the Eagle-Picher strike, which has tied up all mining and milling operations as well as transportation and power facilities of the mining and smelting company's subsidiary in the Tri-State mining field, and at 20 other mining companies shipping their ore to the firm's Central Mill. Negotiations between the company and Local 861, IUMMSW, held August 3 and 4 failed to bring a settlement.

Reports were current locally that a "back-to-work" movement might get under way. It was generally known throughout the district that a majority of the workers were anxious to get back on their jobs and that only a small minority, mostly former employees at the Central Mill and international union leaders, were holding up settlement because of differences in "fringe" issues, particularly that of seniority rights at the mill.

The company was reported to have offered on July 29 an additional 3c. per hr. wage increase above the 10.2c. per hr. average increase offered at the outset of negotiations. Offer of the additional 3c. was announced in the wake of the sharp advance in price of zinc concentrates.

★The No. 7 mine mill of the American Zinc Company of Oklahoma was destroyed by fire from lightning on July 30. The mill proper, mine derrick and hopper, and tailings conveyor were a complete loss. Firemen were able to save the mine office building and tool warehouse structure. The mill, formerly owned and operated by Evans-Wallower Zinc, Inc., was constructed by Golden Rod Mining & Smelting Co. in 1917. Whether the company, a subsidiary of the American Zinc, Lead & Smelting Co., will rebuild has not yet been decided, according to J. J. Inman, district manager for the company. To replace the loss would cost at least $100,000.

★Frank Ford of Linn Creek, Mo., discovered a deposit of antimony (stibnite) ore in early August, the first of its kind to be found in mineable quantities in the State. It was thought that the discovery was probably of greater scientific importance than commercial.

Antimony is one of the two metals, tin being the other, of such scarcity that the Government has never released its wartime control.

NEW MEXICO

Red River and Questa districts active —Linchburg making regular shipments to Empire Zinc mill

★Several old properties have been reopened along Lower Pioneer Creek in Taos County; claims belong to the Silver Tip group owned by Charles F. W. Young, Teague, Tex.; Mrs. L. M. Smith, Red River, and R. T. Keeling, Leona, Tex. Most of the work has been done on the Dyke Tunnel, where Mr. Young reported that a 26-in. vein containing molybdenite was cut. A smaller stringer 2 in. wide containing disseminated molybdenite occurs near the face of this same working.

★The Kerschner brothers of Red River have made arrangements to open the road to the Memphis mine 5½ miles up Bitter Creek. Approximately 10,000 tons of gold-silver ore averaging over $10 per ton has been blocked out in this mine.

★The Independence mine, also in Bitter Creek Canyon about 2 miles beyond the Memphis, has been leased and optioned by California interests. A temporary camp has been established at the mine, and light equipment and supplies were being carried in on pack horses while the road was being cleared for heavy equipment. It is planned to drive at least 200 ft. of crosscut to intercept the network of veins and then commence diamond-drilling.

★The Hornet prospect on lower Cabresto Creek, about 9 miles from Questa, is being re-examined by the Mineral Resources Corp., of Albuquerque. A road has been completed to the dump of the lower tunnel, over 200 ft. of old tunnel has been cleaned out and diamond-drilling is under way. The galena-sphalerite ore occurs in a contact deposit and is associated with pyrite, garnet and calcite.

★The Molybdenum Corporation of

America property 7 miles east of Questa, recovering from the strike that held it down from March 23 to May 15, is mining and milling about 32 tons of ore daily with 45 men employed. J. B. Carman, manager, states that a new vein of ore has been discovered on the lowest level in the mine that averages from 5 to 6% molybdenite.

★The American mine, an early-day zinc-lead-silver producer in the Hachita mining district, Grant County, has been optioned by its owner, Mrs. Maude J. Fowles, to the Empire Zinc Co.

★Hubert Thiel has had a road bulldozed up Jordan Canyon to the Bullet mining claim on top of the Magdalena Range, Socorro County, and is preparing to ship some high-grade ore.

★The Nitt mine, in the Magdalena mining district of Socorro County, is maintaining a fairly consistent shipping schedule of 3 cars of lead-zinc ore per week, which is shipped to the mill of the Peru Mining Co. at Deming.

★The Linchburg mine, 5½ miles from Magdalena, which is leased from the Empire Zinc Co. by C. S. Elayer, W. R. Jenks and H. V. Kessey, employs 39 men and ships approximately 3,000 tons of lead-zinc milling ore a month to the Empire Zinc Co. mill at Hanover, N. M.

COLORADO

AEC station receives first commercial carnotite ore shipment—Bankruptcy court accepts bid on Sunnyside mine

★The first commercial shipment of uranium-bearing carnotite ore from southwestern Colorado since World War II arrived at the Atomic Energy Commission's Monticello, Utah, receiving station recently. The 24-ton shipment was made by F. A. Sitton of Dove Creek, Colo.

★An attempt will be made to locate a vein of uranium and vanadium in the La Veta Pass, Colorado, region 22 miles west of Walsenburg. The Vanadium Corp. of America is said to have obtained a lease on a strip of land 1½ miles wide and 10 miles long and will investigate the area with heavy earth-moving equipment. The owners reported that outcroppings of vanadium and uranium have been found but that the main vein of the ore has not been discovered.

★A discovery of beryl crystals has been made by C. R. Snider and W. E. Smith on the property of the Snider Feldspar Co. near Idaho Springs.

★Rod Fields, who is preparing to mine beryllium near Gunnison, reports that the beryllium content of the ore is running high and he has been setting up a mill to run concentrates of the

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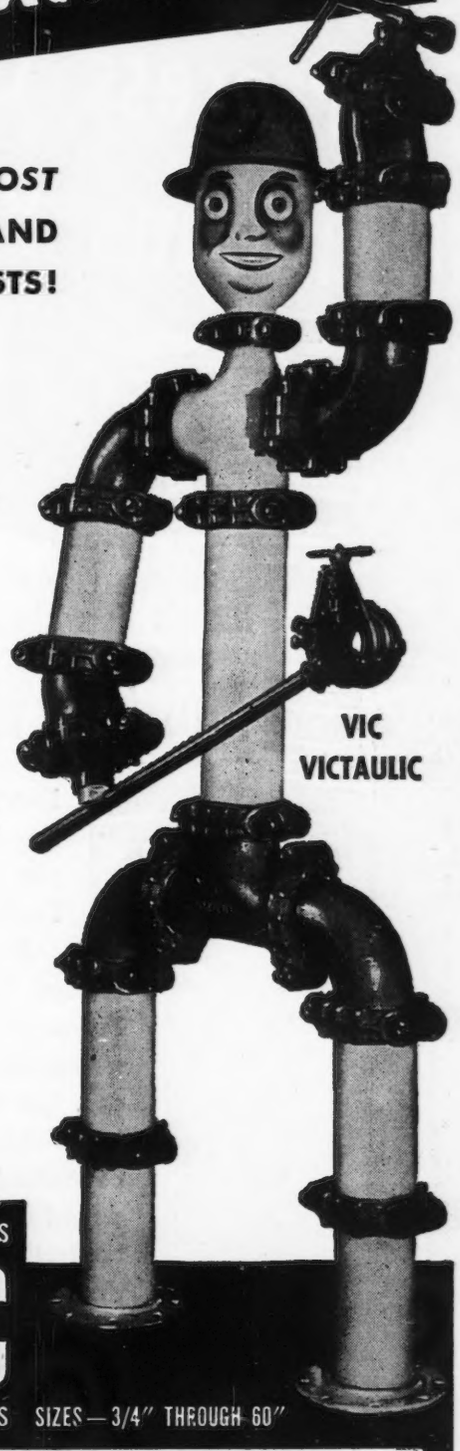

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THERMAL ENGINEERING SPECIALISTS

Colorado *(Continued)*

metal. A government geologist recently visited the mine and government engineers were expected to make further investigations.

★Announcement was made at Cripple Creek that Clyde T. Carson of Colorado Springs is now associated with Gold Empire, Inc., as president and manager of operations, to fill the vacancy created by the death of the late president, John Kolman, and that operations are being started on the Mary Nevin group on Rosebud hill.

★A bid of $250,000 was accepted for the mine properties of the Sunnyside Mining & Milling Co. at Eureka, one of the pioneer metal producers in the state, by a United States bankruptcy court in Denver. The bid was entered by the United States Smelting, Refining & Mining Co., of Boston, which already held 12,000 of the 18,000 outstanding shares of stock in the Sunnyside company. The bid must be passed on by the U. S. district court of Maine, where Sunnyside Mining & Milling Co. is incorporated, before it is finally accepted. The mine produces primarily lead and zinc.

★Gold Mines Consolidated, operating at Silver Plume, is making ore shipments from the Terrible-Dunderberg lead-zinc mine for the first time in 35 years. K. M. Ohlander, of Denver, is president and A. F. Konselman manager. Walter Scott and Harvey Tedrow, mining engineers, are also interested in the operation.

★Industry and government have joined forces informally in a program of exploratory drilling and assay work to determine the value and extent of western Colorado's immense oil shale beds, according to announcement made by the U. S. Bureau of Mines. At least 11 holes are scheduled to be diamond-drilled this summer in the Green River formation. The areas to be drilled are northwest of Rifle and Grand Valley, Colo. Four or more holes are planned by the Union Oil Company of California, and seven by the Bureau, acting for the Department of the Navy. In addition, the Pacific Oil Co., a subsidiary of Standard Oil Company of California, is carrying on geological and assay work to evaluate its properties northwest of the neighboring town of DeBeque, Colo.

ARIZONA

New company reopens Samoa mine —Galena Townsite will furnish 50 homes for Copper Queen miners

★Under the management of J. T. McAvoy, the new Arizona Mining Co. is reopening the Samoa mine 3 miles east of Chloride. The mine is opened by a crosscut tunnel 1,750 ft. long

which cuts the vein at a depth of 700 ft. A raise from the tunnel level to the old works has blocked out 20,000 tons of ore averaging $70 in gold, silver and lead. The ore varies from 1 to 4 ft. in width and continues the full length of the raise. The management plans to continue the tunnel 700 ft. through the mountain, cutting several veins which have produced ore on the surface.

★The Hidden Treasure mine, 2 miles from Chloride, a gold producer 60 years ago, is under lease to Gross Lewis and Don Barksdale. The mine is operated by an 800-ft. crosscut tunnel, 1,500 ft. of drifting on the vein and a winze 100 ft. deep.

★John W. Anthony, mineralogist, Arizona Bureau of Mines, tested a number of samples of ore early in July at Bisbee for possible uranium content, at the request of the Bisbee chapter, Arizona Small Mine Operators Association. Among the radioactive minerals so far identified in Cochise County, according to Anthony, are tyuyamunite, or calciocarnotite, a rare mineral sometimes found associated with the more common carnotite. It has been found as float from an unknown source in the Bisbee district. Allanite is also found in microscopic form in the Tombstone district.

★Arizona's silver production in May totaled 412,000 fine oz., a record for this year's production and also ahead of last year's monthly average of 358,338 fine oz. Arizona's gold production increased in May when 9,000 fine oz. were produced. This compares with 8,700 oz. in April and 7,750 oz. as a 1947 monthly average.

★Tennessee Schuylkill Corp., owners of the Tennessee mine, large lead-zinc producer at Chloride, has announced acquisition of an additional 2,000 ft. of the Tennessee vein through a lease and option of the Johnny Bull-Silver Knight group which immediately adjoins the Tennessee on the south. The company was extending its 1,000-ft. south level toward the new property in July with a distance of only about 100 ft. to go before reaching the Johnny Bull claim.

★Plans for the erection of a 250-ton custom mill at Kingham, by V. H. Hazen and W. J. Howard, have been announced. Operators of the Golden Gem mine in the Cerbet district add that if conditions warrant they will build a second mill of equal capacity.

★The Coronado Copper and Zinc Co. has acquired the Landsman property 13 miles northeast of Klondyke and plan to launch a diamond drilling exploration program.

At the Republic and Mammoth mines, the main operations of Coronado, more than 6,000 tons of copper-zinc ore is mined monthly, with 125 men working on three shifts.

★Work to unwater the Kay mine in the Black Canyon district to the 600-ft. level has been started by W. J.

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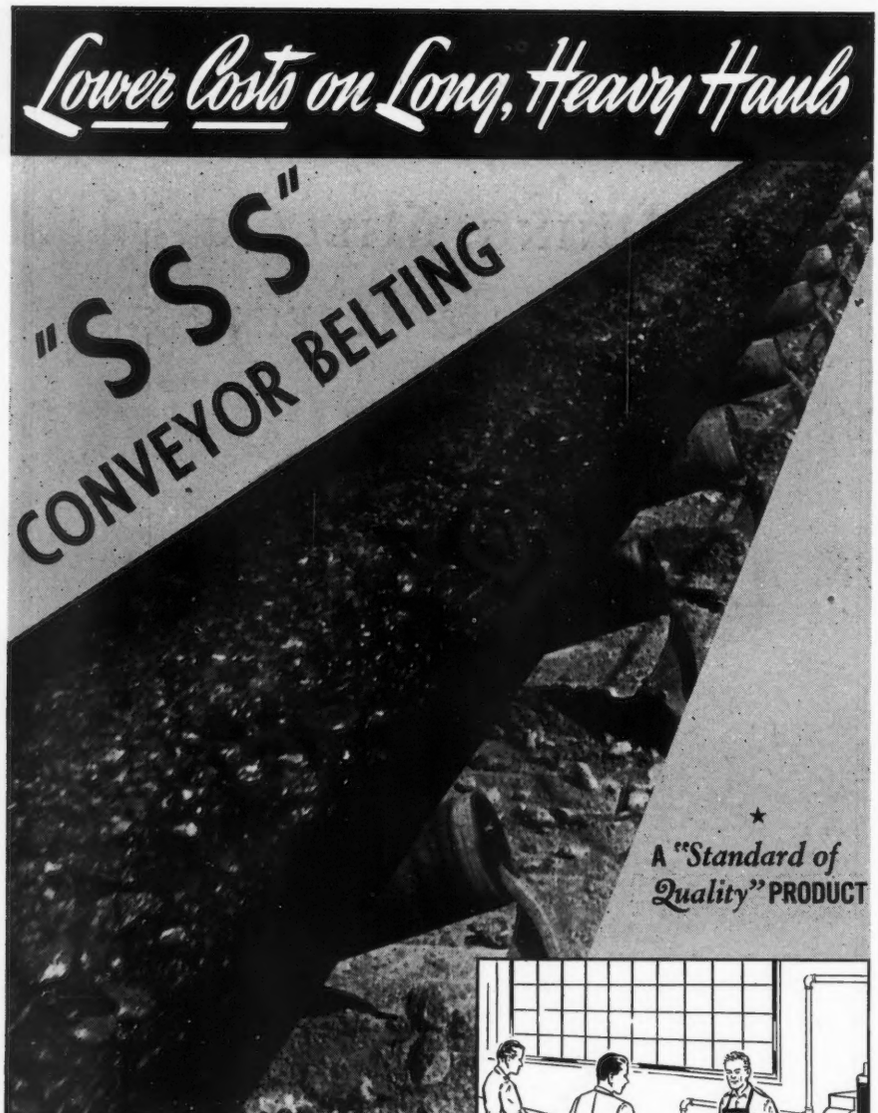

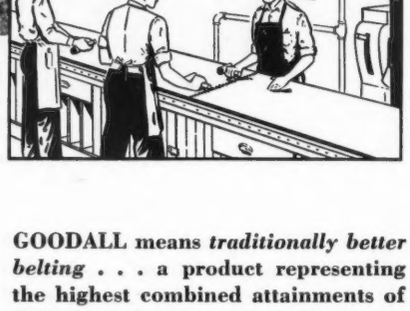

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Arizona (*Continued*)

Forbach of Superior, Ariz. Mining was to begin within 30 days. A 1,500-ft. vertical shaft has been sunk and about 15,000 ft. of drifts, tunnels and crosscuts have been driven. Ore reserve estimates include 70,000 tons of 5.1% copper and probably 100,000 tons averaging 3.57%.

★The opening of a new residential district to be known as the Galena Townsite has been announced by J. B. Pullen, manager, Copper Queen branch, Phelps Dodge Corp., in Bisbee. Fifty new homes will be built immediately for miners employed underground in the Copper Queen mines.

CALIFORNIA

Operators of Afterthought mine completing flotation plant—Strike high-grade ore at Sarita

★According to an announcement by Olaf P. Jenkins, chief, State Division of Mines, the old Horse copper mine on Horse Mountain in Humboldt County has been purchased by the G. L. Speier Co. of Arcata. A small crew of men, with J. H. Griffith in charge, is employed reopening and examining some of the numerous adits and shafts scattered over the 50 mining claims included in the group. The property has been idle for many years, and most of the old buildings that once provided accommodations for some 200 men and housed the mine plant, mill, saw mill and assay laboratory are in a wrecked condition. Copper minerals including chalcocite and malachite with some bornite and native copper occur in lenses in shear zones in serpentine. They appear to be replacement deposits associated with hornblende diorite and gabbro intrusions.

★A strike of high-grade ore was made recently in development work in the Sarita mine near Bridgeport, Mono County, according to C. H. Whinery, president, Sarita Mining Co. The discovery was made during routine sampling of surface pits excavated with bulldozer, and is thought to be an offshoot of the main vein which the company is preparing to mine by open-pit methods. The mine produced some $600,000 in gold bullion during 18 months of operation from 1915 to 1917, with a 30-ton mill handling ore averaging 1 oz. gold.

★Nevada Tungsten Association, Ltd., has started work at its tungsten property on Saddlebag Lake, Inyo County, with 7 men employed under H. W. Hammond, manager. M. L. Morris is superintendent.

★Construction of a 100-ton flotation plant is nearing completion at the Afterthought copper-zinc mine at

Ingot, Shasta County. It was reopened in 1946 by the Mudd interests of Los Angeles, and a substantial tonnage of good ore has been developed by subsequent diamond drill and exploration work. Lyttleton Price, superintendent, is in charge of operations.

★A group of San Francisco and Oakland business men are organizing the True Grit placer mine in Township 19 N, Sierra County. They plan to hydraulic the gravel; the 15 million yd. tested has averaged 45c. per yd. Early in August three miles of ditching had been done, with three more to go to tap Oregon Creek.

NEVADA

Several old mines open—Yuba Company interested in Round Mountain Dredging Corporation

★Yuba Cons. Gold Fields, Ltd., San Francisco, is reported by Yuba officers to have acquired a substantial interest in Round Mountain Gold Dredging Corp., holding a long-term lease on formerly productive placer and lode mines at Round Mountain, central Nye County, owned by Nevada Porphyry Gold Mines, Inc. Gravel deposits are of a type precluding dredge operation, and equipment will include a central washing plant, long conveyor belts and power shovels. The project is expected to attain capacity production next year.

★Combined Metals Reduction Co., of Pioche, has undertaken prospect drilling in the Freiberg district, Lincoln County, on claims patented in 1875 which later produced high-grade silver-lead ore from shallow workings. No development at depth was undertaken and the camp has long been idle.

★Property of the Old English Gold Corp. in White Pine County, first opened in the early 70's and closed down during the war years, has been equipped with a 50-ton flotation mill that has been recovering around $15 per ton from highly siliceous copper-silver ore, according to Joseph Hafen, president, who added that a product of higher grade is to be trucked to the Kennecott smelter at McGill.

★U. S. Geological Survey technicians recently scheduled a 4-day aerial magnetometer survey of the Virginia City (Comstock lode) and Steamboat Springs areas, covering more than 150 sq. mi., to seek new ore deposits and to correlate features of already-mapped geology in the formerly productive territory, it was reported by Julian D. Sears, acting director of the Survey.

★The old Klondyke mine between

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LORAIN ROLLED PLATE LININGS AND GRINDING BALLS

UNITED STATES STEEL

Nevada *(Continued)*

Tonopah and Goldfield is being equipped by Harold Lankford of Goldfield, and associates, with a 100-ton flotation mill following development of silver-gold-lead ore.

★Summit King Mines, Ltd., wholly-owned subsidiary of Bralorne Mines, Ltd. of British Columbia, closed down in 1942 by Order L-208, has been treating 50 tons per day of gold-silver ore in its 75-ton cyanide mill at its Dan Tucker mine in central Churchill County and lately has increased mine crews and expanded development work on and below the 500-ft. level. P. G. Dobson of Fallon is manager.

★Dayton Cons. Mines Co., having completed repairs to its New York shaft below Gold Hill in the Comstock district, is exploring new ground on the 600 and 700-ft. levels and driving raises from the deeper level. Some ore has been crushed in the 200-ton cyanide mill and the storage bins were reported to be full of custom ore.

★In the Mohawk No. 2 claim at Goldfield, from which early lessees produced rich gold ore, development of ground near old stopes is being conducted by H. T. Matson, geologist with the Newmont Mining Corp., and August Anderson, veteran Goldfield miner. The area was prospected by drilling last year but the earlier lessees found no ore. Newmont is completing construction of a 120-ton mill at the nearby Florence mine and developing unexplored ground to the west.

★A U. S. Geological Survey engineer took samples of ore from the property of the Henebergh brothers at Round Mountain to Tonopah, where tests were said to have established radioactivity.

★Gold ore from the Senator Stewart mine near Rhyolite, southern Nye County, is being trucked to the 25-ton Quinn cyanide custom mill a mile south of Beatty. The mill was designed for flotation but equipment was changed before completion and results were said to be satisfactory with the siliceous ore.

★The old General Thomas silver-lead-zinc mine in the Lone Mountain area, 20 miles west of Tonopah, has been reopened by Gene Perry and F. D. Knude, of Mina, who are developing on the 100-ft. level and report they are breaking $75 ore.

★Airlanes Gold-Copper Mining Co., Norman C. Stines, directing engineer, is developing copper deposits in the Stillwater range of Churchill County.

★Chemical & Pigment Co., with principal plant at Melrose, Calif., is trucking 3,000 tons of barite to the rail point at Luning from deposits at Ellendale. The company also has shipped a large tonnage of barite from its deposits a few miles east of Battle Mountain in Lander County.

OREGON

★Bonanza quicksilver mine, near Sutherlin, is operating its furnace about 2 weeks each month. Approximately 20 men are employed and mining is continuing on 3 levels. Superintendent is C. G. Whelchel.

★Oregon Chrome mine in Josephine County is in production. The ore is being shipped to Tacoma, Wash. According to the *Ore.-Bin*, it is the only producing chrome mine in the United States.

★Carl J. Trauerman, secretary of the Montana Mining Association, told the National Association of Securities Administrators at Portland, July 21, that barriers to original financing of mineral development should be removed. He stressed the importance to our national economy of raising venture capital for small legitimate mining promotions. Mr. Trauerman said many mining failures are due to lack of money rather than to lack of ore.

★Bartells Brothers Mining Co. is operating the Champion mine in Lane County. The mill was to start operating August 1. Three diesel engines have been added to the equipment.

★According to a preliminary U. S. Bureau of Mines report, the State's mineral production for 1947 was $16,700,000, compared to $11,783,000 the previous year. The previous peak year had been 1942 with $14,065,572. Nonmetallics accounted for $15,900,000 of the more than $16,000,000 in 1947.

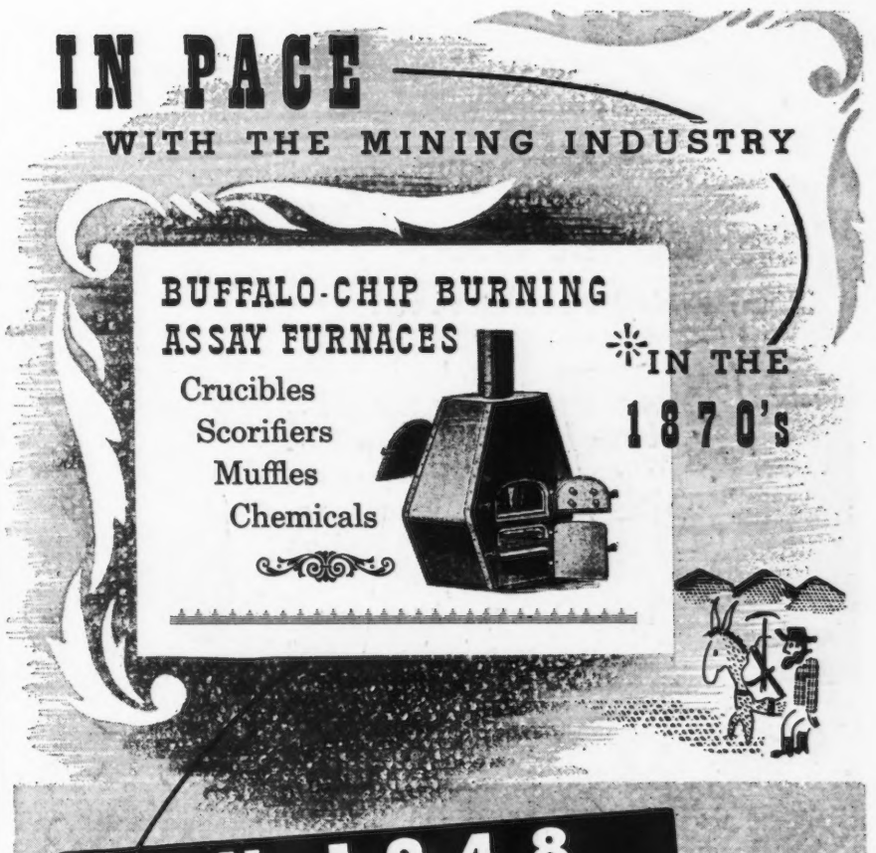
WASHINGTON

Pend Oreille provides apartments at Metaline Falls—Columbia Gypsum to build plant near Greenacres

★Howe Sound Mining Co.'s 300 employees at Holden accepted a 12c.-an-hour wage increase in mid-July, according to J. J. Curzon, manager. A two-year contract retroactive to July 1 includes vacations of one and one-half weeks for employees of one year to three weeks for 10-year employees, and six paid holidays a year. The company will provide rubber clothing for miners working in wet ground.

★A $250,000 plant to be used in manufacturing steel ingots is being constructed on a 21-acre site at Tacoma, according to E. F. Cunningham, head of the Cunningham Manufacturing Co., of Seattle.

★Tacoma smelter employees, numbering about 1,200, accepted a 12c.-an-hour wage increase, July 22, retro-



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Washington *(Continued)*

active to July 1, bringing minimum pay at the smelter to $1.325 per hr. A 30c.-an-hour increase had been asked by the MMSW. Provisions of the contract include retention of all benefits previously won by the union.

★Pend Oreille Mines & Metals Co. plans to complete a $150,000 five-story apartment house containing 58 apartments about Nov. 15 for its employees at Metaline Falls, according to Charles A. R. Lambly, superintendent. The building will be fireproof and soundproof, will be electrically equipped and have modern elevators, as well as laundry facilities and a community hall. The housing will be part of the company's expansion program which includes construction of a 2,500-ton mill.

★A temporary restraining order, prohibiting union interference with American Zinc, Lead & Smelting Co.'s efforts to operate its strike-bound Grandview mine and mill in the Metaline district, was issued Aug. 3 by W. Lon Johnson, Superior Court Judge, against IUMMSW and Local 515 at the company's request. The order limits the pickets to six and prohibits "threatening, intimidating or using force against any non-striking employees." A court hearing on a permanent injunction was set for August 17. A reported beating of an employee and two dynamite blasts near non-striking workers' homes had been investigated by the sheriff's office.

★U. S. Geological Survey office for the northwest, including Idaho, Montana, Oregon and Washington, was moved in July from 707 Peyton Building, in Spokane, to S. 157 Howard St., according to A. E. Weissenborn, regional geologist.

★Nighthawk Silver-Lead Mining Co. has been organized to reopen and develop a property northeast of Hayden Lake, formerly owned by the old Hayden Creek Mining Co. Plans are to clean out two old shafts, 170 and 300 ft. deep, and about 2,500 ft. of underground workings, and then sink on the central vein.

★A phosphate deposit is reported to have been discovered by geologists seeking northwest phosphates for fertilizer use, near Boylston, on the Columbia River. The land is owned by D. B. Sanders, a Kittitas sheep rancher who said no plans have been made as yet for development.

★The State's production of lead amounted to 775 tons in May, compared to 800 tons in April and an average of 383 tons in 1947. The zinc production in the State was 1,175 tons in May, compared to 1,290 in April and an average of 1,136 tons in 1947.

★Columbia Gypsum Products Co.'s application for a special permit to construct a $50,000 plant east of the naval supply depot, near Greenacres,

was granted early in August and the company has purchased the 72 acres of land on which it had an option. It has also taken an option on 92 additional acres. The company plans to spend $600,000 on construction to be used in producing building materials and fertilizer. According to Thomas H. Palmer, engineer for Columbia Gypsum, crude gypsum may be shipped from the company's quarries at Windermere, B. C., more than 100 miles north of the Canadian border, into the U. S. duty free. It is expected that construction of the new plant will be well underway by mid-winter.

★Moonlite Mining Co., operating a lead-zinc property about 20 miles north of Colville, has made a second shipment to the Trail smelter, according to H. J. McClellan, Sr., president. This carried 30% zinc and 34% lead. Machinery for a 17-ton mill is at the property.

★Engineering work has begun on the Twin Lakes "mine to market road" in Whatcom County of northeast Washington, which is to open up the Silesia Creek district, a productive gold-mining area 60 years ago. The road to be constructed will lead from Swamp Creek to the Twin Lakes area north of Shuksan.

IDAHO

Apache purchases ball mill from New York company—Sullivan to enlarge zinc plant at Kellogg

★The Idaho Farm Bureau Federation and Gates Brothers of Wendell, Idaho, announced late in July the completion of plans for production of phosphate fertilizer by the Wendell firm and distribution through the federation. A plant for processing phosphate rock is nearing completion at Wendell at a cost of $1,500,000. The plant will process triple super-phosphate containing 43 to 48% highly concentrated plant food. The federation has 5,640 acres of phosphate land under lease 20 miles east of Montpelier in southeastern Idaho and western Wyoming, and Gates Brothers has 2,000 acres leased in the vicinity of Montpelier and Paris and near Lakestown, Utah, where open-pit and underground mining is being carried out.

★Rehabilitation after 30 years of idleness is under way at the Hypotheek mine south of Kingston, where the shaft headframe has been repaired, two new 48-in. sheaves mounted on it, and a deep well pump suspended from a special cage for unwatering the deep shaft at the 1,100-ft. level. The company plans initial exploration work on the vein east of the fault on the 700 level.

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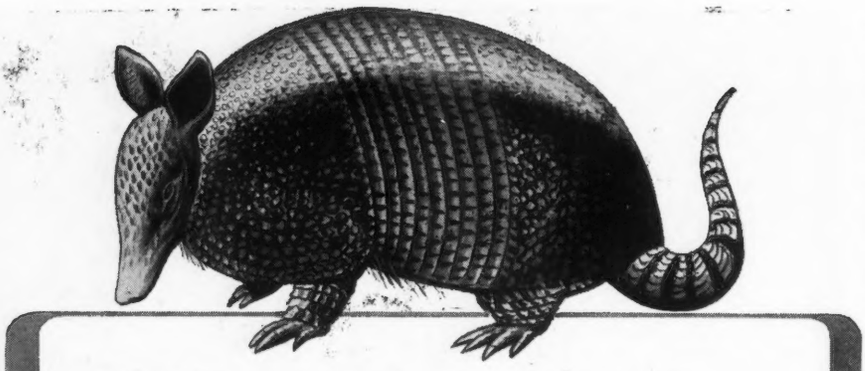

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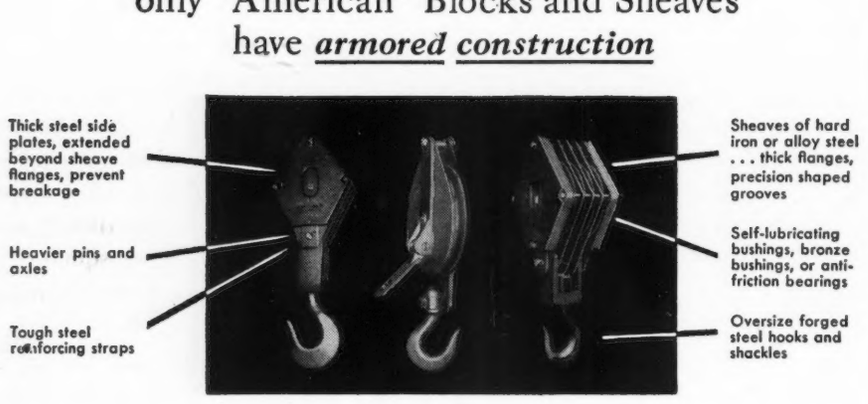
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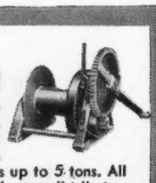

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Idaho (*Continued*)

★New wage agreements reached recently by 32 mining companies of the Coeur d'Alene district and local unions of IUMMSW, affecting about 5,000 men, have resulted in the following wage scale for this district:

Classification for Mines and Wage Rates

	Old Scale	New Scale
Miner	$10.69	$11.65
Surface labor	9.94	10.90
Mucker	10.19	11.15
Timberman	11.19	12.15
Timber repairman	11.44	12.40
Raise miner	11.19	12.15
Drift miner	11.19	12.15
Sinking shaftman	11.69	12.65
Main line motorman (trolley)	11.19	12.15
Main line motorman (battery)	11.94	12.90
Level motorman	10.69	11.65
Swampers (main line trolley)	10.69	11.65
Swamper	10.44	11.40
Cagers	10.44	11.40
Mucking machine man	10.69	11.65
Trackman	10.69	11.65
Pumpman	10.44	11.40
Pipeman	10.94	11.90
Nipper and powderman	10.69	11.65
Bull gang (yard and common labor)	9.94	10.90
Mechanics, 1st class	11.44	12.40
Mechanics, 2nd class	10.94	11.90
Machinists, 1st class	11.44	12.40
Machinists, 2nd class	10.94	11.90
Welders, 1st class	11.44	12.40
Welders, 2nd class	10.94	11.90
Blacksmith	11.44	12.40
Carpenters	11.44	12.40
Helpers, all classifications	10.44	11.40
Shaft repairman	11.69	12.65
Truck driver (heavy)	10.69	11.65
Truck driver (light)	10.69	11.65
Watchmen	10.44	11.40

Mill Classification and Rates

Flotation operator	10.94	11.90
Repairman	10.94	11.90
Millman	10.44	11.40
Mill labor, inside	10.19	11.15
Repairman helper	10.44	11.40
Common labor	9.94	10.90

Sawmill Rates

Head sawyer	11.19	12.15
Sawmill operator or helper	10.44	11.40
Sawmill labor	9.94	10.90

★The Coeur d'Alene Mines Corp. is starting a new development program recommended by Roger H. McConnel, head geologist for the Bunker Hill, and Robert E. Sorenson, geologist for the Hecla company. Plans include a crosscut from the 1,400-ft. or 2,800-ft. level to the Commodore Truxon vein some 1,500 ft. north of the present workings.

★Golconda Lead Mines Co. recently purchased control of the adjoining Square Deal property and started a drift on the strike of the Golconda vein with the intention of following it on into the Square Deal. It was first necessary to drive 1,000 ft. of new tunnel on the 1,000-ft. level to bypass caved ground and pass through a fault which has cut the Golconda

vein. On the east side of this fault the company has again picked up the vein where it carries a 2-ft. width of first-class milling ore.

The first carload of drift ore produced a concentrate assaying 66.9 oz. silver and 61.25% lead, bringing the company a net smelter return of $5,455 for the shipment. A small car of zinc concentrates was also realized. The vein at this point is in virgin ground with 1,000 ft. of backs over the tunnel, and has never been mined below the 1,000-ft. level. The Golconda is equipped with a modern 225-ton flotation plant which has been operating as a custom mill.

★Highland-Surprise Mining Co. has enlarged its milling plant on Pine creek from 150 to 300 tons per day and is now operating on the increased basis. The company has opened five parallel vein systems, three of which are in production, while the other two have not been prospected except by diamond drill. One of the three producing veins is from 10 to 15 ft. wide and carries a good grade of zinc-lead ore.

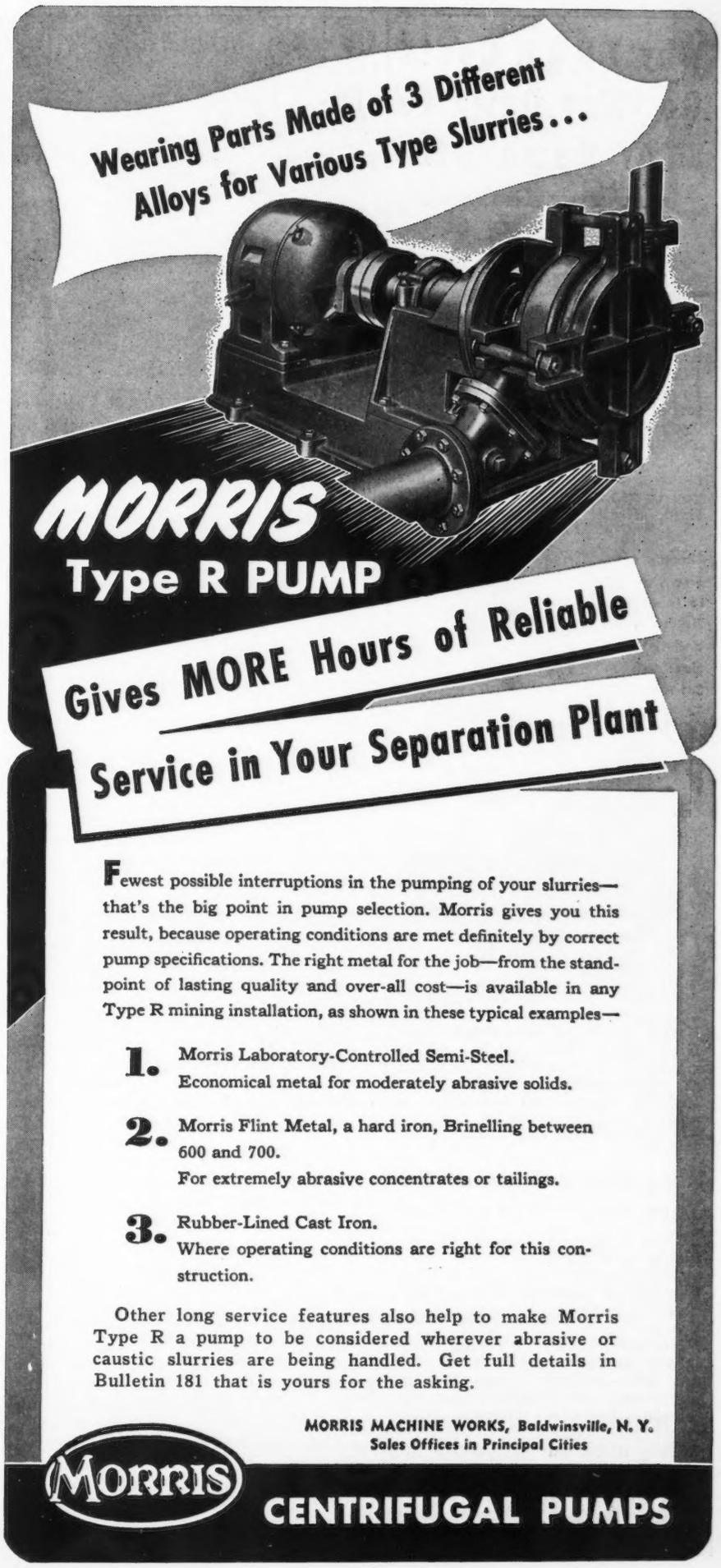
★Apache Mines Co. has purchased a 500-ton ball mill from the Callahan Zinc-Lead Co. of New York, who had it in operation at the recently closed Deadwood mine. The mill, to be erected near Hailey, where the company is operating 20 claims under lease, is intended to run at about 150 tons per day when first installed, but this capacity may be increased to 500 tons or more per day by addition of more grinding elements or ball mills. When the plant is set in place it is estimated that the value of mill, equipment and accessory treatment systems will be from $250,000 to $500,000.

Installation was nearly complete in July on a new type concentrator designed to run on some of the old mill tailings until the large mill is established, which is expected to be the end of October. The company recently hand sorted and shipped to a Utah smelter a trial 50-ton carload lot of the ore and received net smelter returns of $794.59.

★The Idaho State Bureau of Mines has employed Thor Kiilsgaard as a full-time geologist to visit abandoned mining camps of the state to make a geological study of the possibilities for renewed mining development. He will be accompanied by George Glarborg, a student.

★According to statistics released by the U. S. Bureau of Mines, Idaho's silver production for 1947 was up 59% from wartime levels to 10,345,779 fine oz., and lead up 32% to 157,888,000 lb. Production of gold was up 51%, zinc up 16% and copper up 58%, resulting in one of the highest metal production years in the State's peacetime history.

Total production of the five metals was estimated by the Bureau at $54,167,842, as compared with $37,610,123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MILL OF HIGHLAND-SURPRISE Cons. Mining Co. at Pine Creek, Idaho. Milling capacity was recently increased from 150 to 300 tons per day.

Idaho (*Continued*)

in 1946. Lead accounted for 42% of the total value; zinc, 35%; silver, 17%; gold, 4%, and copper, 1%.

★The zinc output in the Coeur d'Alene district increased from 134,858,000 lb. in 1946 to 158,502,000 lb. in 1947; lead output increased from 113,096,000 to 146,120,000 lb. during the same period, and copper production from 1,619,000 to 2,624,000 lb., according to the Bureau of Mines. The steadily increasing copper production of the Coeur d'Alene district is due to a by-product of the silver ores, which also accounts for a large production of antimony not given in the Bureau's report. The silver production of the Coeur d'Alene district, the report continues, increased from 5,655,672 to 9,234,906 fine oz., and gold production of the district from 1,758 to 2,808 fine oz.

★The Sullivan Mining Co., jointly owned by Bunker Hill and Hecla, has announced that it will immediately build an addition to the company's $3,050,000 electrolytic zinc plant at Kellogg at an expense of $750,000. The Sullivan Company owns the Star mine located between Wallace and Mullan, and also treats custom zinc ores in the district. A large stockpile of untreated ore has accumulated and the company has been compelled to curtail zinc ore purchases by one-third until the plant enlargement is completed.

★The Bradley Mining Co. has started construction work under contract to the Western-Knapp Engineering Co., of San Francisco, building a 150-ton milling plant at the Ima tungsten mine near Patterson, in Lemhi County, to replace the mill burned last December. The new mill is expected to be in operation in October. Since the exhaustion of the Bradley company's tungsten deposit at the Yellow Pine mine at Stibnite, the Ima has become the largest tungsten mine in Idaho. Its orebodies are low grade and run about 1% tungsten, the tungsten mineral being wolframite. They occur in an extensive vein system. The Ima ore also carries lead and copper. Approximately 70 men are employed in the mine and mill.

★The Western-Knapp company is also constructing a million dollar antimony smelter for the Bradley company at the Yellow Pine mine, Stibnite, which is now being worked for its antimony and gold content.

★Net smelter returns of $31,310.28 have been received by the Lucky Friday Silver-Lead Mining Co. for 2 cars of silver-lead concentrates shipped to the AS&R East Helena smelter, and $1,472.16 for a 20-ton car shipped to the Sullivan zinc plant, making a total of $32,782.44 for concentrates recovered from 1,743 tons of mine-run ore milled at the Golconda custom plant. This brings Lucky Friday's total ore shipment to $652,213.24 since beginning mining operations, most of which has been derived from development ore taken out in sinking to the 1,400-ft. level.

It was the policy of the company to produce enough ore from each level to provide funds for sinking to a deeper level. Since reaching the 1,400, raises have been driven back to the surface, providing good ventilation. The company is now preparing to sink an additional 600 ft. to the 2,000-ft. level.

UTAH

Judge dissolves restraint on Midvale members—USSR&M gains title to Bingham Metals property

★A 2-week-old temporary restraining order barring seceded members of Midvale Mine Mill & Smelter Workers Local 331 from using the name of the local or expending union funds was dissolved July 31 by Judge J. Allan Crockett.

"It seems necessary and proper under the law to grant the motion of

the defendants to dissolve the temporary injunction because of the anti-injunction law, known as the 'Norris-LaGuardia act' which was adopted by the 1937 legislature of Utah," Judge Crockett wrote.

International Union of Mine, Mill & Smelter Workers obtained the restraining order on grounds that members of the Midvale local in leaving the international union had not complied with the MMSW constitution, which requires that 90 days' notice be given before any vote to secede and that 5 members may hold the charter and property of a local even should the remainder vote to secede.

A similar action is pending relative to the Garfield Smeltermen's Union, which is independent. The Midvale local has applied for affiliation with Progressive Metalworkers' Council.

★A twice-postponed strike called by MMSW against Kennecott Copper Corp. was postponed indefinitely Aug. 8 with the company accepting working provisions of the old contract which expired July 1, but refusing to enter into a new contract with the union. Kennecott posted a 12c.-an-hour general wage increase Aug. 5, the date first scheduled for a strike. Another bulletin said the company would continue operations notwithstanding the projected strike and would offer employment for all employees reporting for work.

The first postponement announced late in the evening Aug. 4 followed a plea from the Federal Mediation and Conciliation Board asking for 48 hours in which to attempt to settle the differences. Donald G. Godman, commissioner of conciliation, met with union and company representatives in joint and separate sessions the next two days and was joined by Dan Edwards, state industrial commissioner in charge of labor relations. The second postponement "for at least 48 hours" was announced Aug. 6.

MMSW had proposed that (1) local union officers furnish the company with notarized statements that they are not members of the Communist party and that they do not advocate overthrow of the government by force or violence, or (2) that negotiations be started immediately and a contract signed, with the entire question of signing non-Communist affidavits being postponed until after the Supreme Court should decide on constitutionality of the affidavit provision of the Taft-Hartley law. If held constitutional, local unions were to file such affidavits.

The company rejected both proposals, holding to its ultimatum that at least officers of local unions file the affidavits with the NLRB. In the absence of a contract the way is left open for petitioning for NLRB election provided Progressive Metalworkers Council, CIO, or any other union obtains signatures of 30% of membership of the bargaining units.

D. D. Moffat, vice president and general manager of the Utah Copper

Here's a Better-than-New Idler for $25.96

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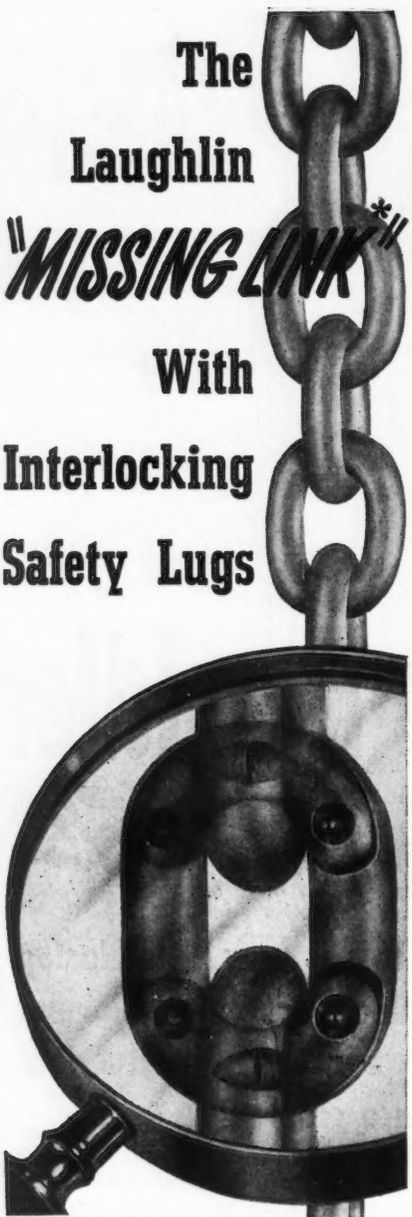

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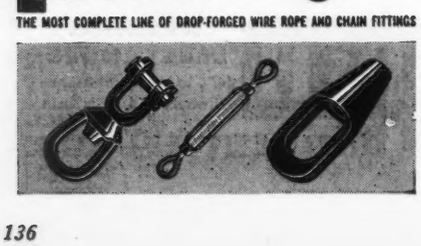

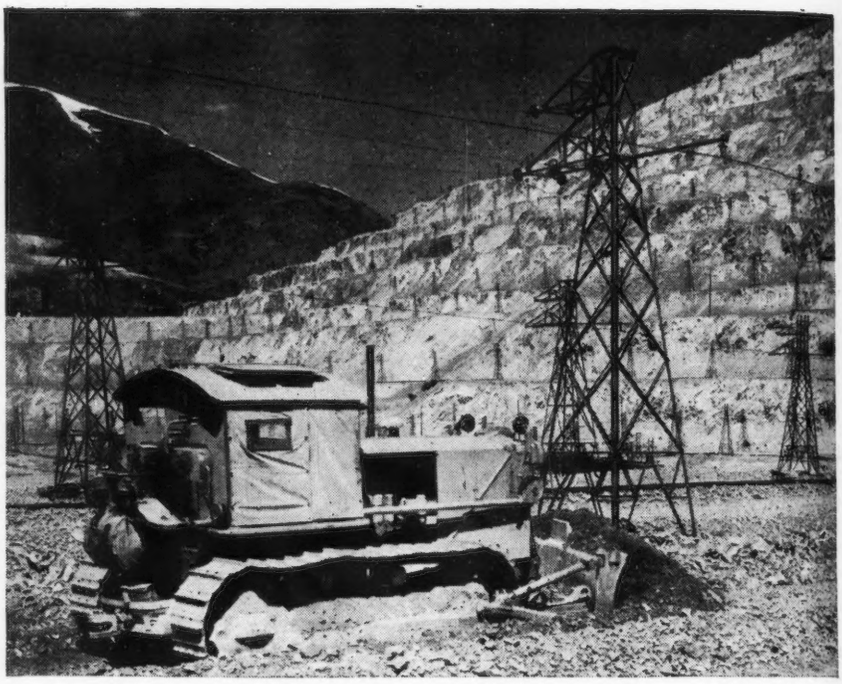

AT KENNECOTT MINE near Bingham Canyon, Utah, world's largest open-pit copper mine, tractor and bulldozer relocate railroad track.

Utah *(Continued)*

division of Kennecott, said he did not intend to imply that officers of the local unions are not loyal to the government. "We believe our employees to be loyal, but cannot say the same for leaders of the international union," he declared.

★The new four-mile Bingham transportation tunnel to serve U. S. Smelting, Refining & Mining Co. properties at Bingham, and removal of the company's surface plant in Bingham to the portal of the new tunnel near Lark, are scheduled as part of a major operation to permit Kennecott Copper Corp. to extend its open pit mining operations at Bingham. The project, which will give both companies a deep outlet, will require about three years for completion, said F. S. Mulock, vice president and general manager of western operations for U.S.S.R. & M.

The new tunnel, to take the place of the present Niagara tunnel, will average 10 x 9 ft. in cross-section and will connect with the Niagara No. 2 shaft of U.S.S.R. & M. on the 1,000-ft. level and with other workings where necessary to replace present handling facilities.

★International Smelting & Refining Co. has leased Miller Hill Mining Co. properties in American Fork canyon and will begin operations soon, working through the Pacific Hill (American Fork Consolidated Mines) property on the north.

★The first of many shiploads of Utah iron ore bound for Japan has left San Pedro, Cal., Arthur L. Crawford, member of the Utah publicity and industrial development commission, reports. This is part of an initial order of 40,000 tons of Utah iron ore earmarked to aid recovery of Japanese industry.

★Title to real property of Bingham Metals Co. has passed to U. S. Smelting, Refining & Mining Co. with foreclosure of a mortgage. Included are 25 acres on which there are 8 unpatented claims. U.S.S.R.&M. Co. bid $18,000 for the property at a public auction, which was the amount of a judgment against the Bingham firm. Glen L. Loveless, president of Bingham Metals, obtained the mine equipment on his bid of $2,000.

IRON COUNTRY

Pacific Isle company installs concentration unit—Soft ground delays Cleveland Cliffs laboratory

★The old Groveland mine property, east of Randville on the Menominee range, is being diamond-drilled by Hanna Coal & Ore Corp. First opened in 1891, it had been operated by various companies prior to 1913, the total production being close to 150,000 tons. Low iron content kept the ore unattractive up to the present. Hanna has taken an option and plans to drill several holes. Ira Odgers, diamond-drill contractor from Crystal Falls, is doing the work.

★Soft ground having been encountered under the site selected by Cleveland-Cliffs Iron Co. for its new research laboratory, the company had

to delay construction until 150 piles had been driven to support the foundation. Sewer and drain lines are installed and forms being erected.

★At the Bengal iron mine of Hanna Coal & Ore Corp., near Iron River, the shaft has been sunk 200 ft. and drifting started on the new level. In the open-pit Richmond mine near Palmer, Mich., shipping has been active for the season, a high siliceous product being secured.

★A joint meeting of the Engineers' Club of Northern Minnesota and Duluth Engineers' Club was held at the Esquagama Club near Virginia, Minn., on August 7.

★More than 1,800,000 tons of iron ore was shipped by all rail transportation from Lake Superior iron mines in 1947. Duluth furnaces received a large part of the total, but smaller tonnages went as far as Sydney, Nova Scotia; Pittsburgh, Pa., and Daingerfield, Texas.

★Snyder Mining Co. is diamond drilling at the Martin mine on the Cuyuna range. The S. E. Atkins Co., of Duluth, has the drilling contract. John Stitzer is directing the work for the Snyder company.

★Following the lead of the steel companies, most of the iron mining companies of the Lake Superior regions are reopening the matter of wages under their contracts with their union employees.

★Total shipments of iron ore from Minnesota and Michigan iron mines up to Aug. 1 were 42,365,468 tons. With no interruptions between now and the season's end and with favorable fall weather, the total shipments for the 1948 season should be 85,000,000 tons or better.

★Last May the Haley-Young Mining Co., Hibbing, began development of its new Elbern mine located between Chisholm and Buhl. The property adjoins the Sherman mine (formerly the South Frazer) of the Oliver Iron Mining Co. An article describing the work of stripping appears on page 78 of this issue.

★Stripping at Butler Brothers' South Agnew mine is proceeding according to schedule. The new dragline is now working on the second lift of its first cut and the outlines of the pit are practically established. The sand that was a constant nightmare when the mine was worked by underground methods makes ideal material for dragline excavation and the machine is justifying its purchase in handling the sand. The stripping scheme employing the big dragline and the conveyor system, the present length of which exceeds a mile, was described in the August issue of *E&MJ* on pages 70 to 74.

★The Pacific Isle Mining Co., of which Hugh Harrison is president, is completing the installation of a "portable" Heavy-Media concentration unit

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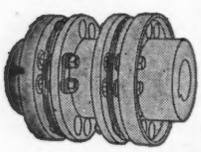

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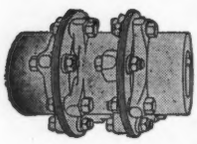

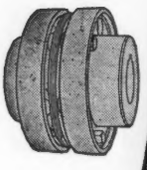

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Iron Country *(Continued)*

which is about ready for test runs. Unit capacity is rated at 25 to 30 tons of feed per hr., but is expected to be better than this in operation. In addition to improving the grade of the concentrates, the unit will make it possible to handle some lean ores that the plant cannot treat successfully at present.

★A report entitled "Magnetic Survey and Geology of the Eastern and Southeastern Parts of the Iron River district, Iron County, Michigan," prepared by Harold James and Kenneth Wier, has been issued by the U. S. Geological Survey. It is identified as No. 26 of the series of circulars that is being issued to report the results of a re-study of the Lake Superior deposits of iron ore.

MICHIGAN

Calumet & Hecla uses trucks to cut freight costs—Extend contract with copper workers to Dec. 31

★The raise from the 33rd level of Ahmeek No. 4 shaft of Calumet & Hecla Consolidated Copper Co. to the bottom of Seneca No. 2 shaft has been discontinued after reaching a height of 1,300 ft., making this the highest raise on the Kearsarge lode. Shaft sinking in Seneca No. 2 to meet the Ahmeek operation will hole through in about four months. Drifting in Seneca is continuing on the 20th level south and on the north side of the 24th level.

At the Centennial, drifting is under way on the 43rd level. Another lift has been made in sinking the Kearsarge shaft and a plat is being cut at the 35th level. In the Allouez mine, a plat is being cut at the 17th level and drifting continued on the south side of the 12th level and both north and south on the 16th level. In the Iroquois mine, drifting is under way on the north side of the 16th level.

★The contract between Calumet & Hecla and the Calumet & Hecla Copper Workers Local 584 of the International Mine, Mill and Smelter Workers, CIO, has been extended to Dec. 31, 1948, when it will terminate without notice unless a further extension is agreed upon. Negotiations have been in progress for several months. Since the present price of copper does not permit a wage increase, a new agreement cannot be reached at this time.

★During July, Calumet & Hecla instituted an innovation in transporting copper from its Lake Linden smelter to Detroit. On July 7 Hillenbrand Brothers of Lake Linden, with a trailer truck of new design, hauled 18 tons of copper billets from the smelter to the Wolverine Tube division plant at Detroit, where the copper was unloaded by crane. For the return trip the truck was loaded at Solvay Sales Corp. plant with 12 tons of soda ash in 23 minutes. The round trip from Lake Linden to Detroit and return was made in a little over 40 hr. It is expected that a considerable saving in transportation costs can be effected by the use of trucks.

WISCONSIN

★Four zinc deposits situated close together, near Shullsburg in southwestern Wisconsin, will be worked by Calumet & Hecla Consolidated Copper Co. as one mine through a central shaft. The ore is zinc sulphide with some lead sulphide. The orebodies are shallow, being about 300 ft. from surface. Exploration began in April, 1947, and hundreds of churn-drill holes and some diamond-drill holes were put down. A headframe has been erected and sinking started. The shaft will be 335 ft. deep and will have two skip compartments and a ladderway. This work is expected to be completed in December, when crosscutting will start. Hoisting capacity will be 1,200 tons per day.

The ore will be concentrated in a plant purchased from the War Assets Administration, which was built during the war to treat tailings. Now about 30 miles from the mine, it will be moved to a site near the new shaft. Jigging and flotation will be employed, enough additional equipment being added to give a capacity of 1,200 tons per day. It is expected the mill will be ready about the time the mine gets into production.

A. H. Wohlrab, vice president and general manager of Calumet & Hecla, and O. A. Rockwell, mining manager, will direct the operations of the Wisconsin branch. Harold Ewoldt, branch manager, and George Sullivan, mine foreman, will be in charge at Shullsburg.

ALASKA

Bureau experiment station to be at Juneau — Development work, new buildings at Mahoney mine

★According to Charles M. Johnson, assistant chief of the mining branch of the U. S. Bureau of Mines, six development projects for this year are designed to promote Alaskan mining for metals other than gold. The Bureau, as well as the U. S. Geological Survey, will study the possibilities of such construction ma-

terials as limestone, gypsum, gravel, shale and sand.

★Arthur Thies and associates, who were operating the Rush Brown mine at Salt Chuck, have acquired the Mahoney lead-zinc mine on George Inlet, near Ketchikan, from Aner Erickson. They expect to speed up development work at the property. Necessary buildings for employees are being constructed and a site near the mill is being cleared for the diesel power house. Alonzo Port, of Virginia City, Mont., is superintendent.

★United States Bureau of Mines will locate its proposed experiment station at Juneau, according to Governor Ernest Gruening. A $250,000 appropriation was made by the last Congress. War surplus property buildings at Skagway were being dismantled in July for use at the station, with about 20 persons employed.

★U. S. Smelting, Refining & Mining Co. purchased three patented claims embracing 51,879 acres from the P. A. Vachon estate for $8,500.

★H. A. Wertz, with C. B. Clear and B. H. Carsch, co-owners, is working a cinnabar property near Wrangell.

★Ernest Wolff, Eskil Anderson and R. W. Sellers took drilling equipment to the Big Creek area where they also planned to prospect lode properties.

★Big Four Mining Co. of Ketchikan is said to be shipping lead-zinc ore from ground on Revillagigedo Island.

★4-A Mining Co., headed by Tury Anderson of Slaterville, has resumed operations on Pedro Creek on the Steese Highway.

★Beaton, Zaiser & McFarland Mining Co. is operating a dredge at the mouth of Gaines Creek, near Ophir.

CANADA

Quebec reports increased production for first quarter—Resources Minister announces finds in Saskatchewan

★Canadian lead, zinc, aluminum, copper and nickel consigned to ERP countries for the year ending June 30, 1949, will amount to one-tenth of the total of $1.6 billion of ERP goods available from Canadian industry. The announcement made by Hon. C. D. Howe, Minister of Trade and Finance, indicates that heavy postwar demand on Canadian metal mines will continue long after foreign markets for other domestic products have been eased. For the last six months of this year minimum commitments are valued at $35.3 million for aluminum, zinc, lead and copper. The same metals available for the year ending next June 30 are valued at $68.8 million plus $20.7 million for nickel.

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Canada (*Continued*)

★The Emergency Gold Mining Assistance Act, which became a law in July, will be of greatest benefit to those mines that increase gold recovery over that of the base year ending Dec. 30, 1947. The bonus to be given by Ottawa as assistance payments is intended to prevent mine shut-downs by the marginal operators. The majority of the gold mines will benefit to the extent of only a part of the cost of recent increases in wages. Government assistance applies to all gold output over two-thirds of the 1947 production. Assistance payments will amount to one-half the cost of production in excess of $18 per oz.

★The Atomic Energy Control Board at Ottawa has announced that mining properties not yet at the producing stage are permitted to release any information concerning the exploitation and development of uranium-bearing minerals, including results of analysis of ore samples and assays. Previous rulings by the Board were clarified by the statement that information is restricted concerning the production rate at a uranium property and disclosures of ore reserves. In dealing with the search for and treatment of radioactive minerals, the Department of Mines and Resources has made its facilities available for the assistance of the Board. Isotopes of seven elements produced by the atomic pile at Chalk River, Ontario, since the summer of 1947 have been distributed to the Department of Agriculture and to seven Canadian universities.

★In the first four months of this year Canadian gold output increased to 1,108,742 oz. compared with 975,912 oz. in the same period last year. April production was 172,449 oz. for Ontario; Quebec, 64,108; British Columbia, 26,531; Manitoba and Saskatchewan, 15,846; Northwest Territories, 7,022; Yukon, 84.

★The Dominion Bureau of Statistics reports silver production in Canada for the first four months at 4,182,918 fine oz. compared with 3,563,449 oz. for the same period last year. Primary lead in the same periods amounted to 49,355 tons compared with 52,562 tons. Primary zinc was 72,885 tons in the first four months this year against 68,679 tons in the same period of 1947.

QUEBEC

★Mineral production for the first four months, as reported by the Quebec Department of Mines, shows increases ranging from 8% for asbestos, 28% for gold, and 49% for cement compared with the same period a year ago. Asbestos amounted to 220,875 tons; gold, 238,523 oz.; silver, 542,303 oz.; lime, 125,076 tons; cement, 1,646,666 barrels; and clay products valued at $1,148,545.

★Chamberlin Management Corp., in charge of work at the property of Eldona Gold Mines, reports an enlarged scale of development on the new levels at 700, 850, and 1,000 ft. Diamond drill holes are being put down to explore deeper extensions of the ore zone. The drive east of the shaft on the bottom level has shown increased values in gold, zinc, silver and copper. On the 850-ft. level the new ore zone, located south of the main diabase dike, shows widths considerably greater than had been previously indicated by the discovery diamond drill hole that was put down from the 500-ft. level. A horizontal hole drilled out from the face of the 801 east drift on the 850-ft. level intersected ore across 31 ft. averaging $18.65 per ton in gold. Farther east another 50 ft. a second horizontal hole averaged $12.25 per ton for a width of 33.7 ft.

★Stadacona Mines (1944) reports steady progress in shaft sinking. The 3,200-ft. level station was cut in June and delivery of the new hoist was expected to be made late in July. Production for the first four months of the year amounted to 44,850 tons having average recovery of $6.92 per ton compared with an average of $6.15 per ton for the same period a year ago from 42,229 tons.

★East Sullivan Mines reported suspension of underground work on July 5, when concrete pouring was started for the new headframe and coarse ore bins. Designed by Bronson & Way, Toronto, the headframe is being erected by a method stated to be new in Canadian mining but similar to the process used for building concrete grain elevators. This consists of a "sliding form" process which allows putting up the headframe in one continuous operation, using forms previously prepared. A temporary wooden headframe, which has been dismantled, was used for underground developments from the 5-compartment shaft. The permanent equipment was expected to be in regular use early in August.

★Effective July 1, Quebec gold mines advanced the basic wage rate from 85c. to 90c. an hour. The cost-of-living bonus that is generally paid by Ontario mines has not yet been adopted in Quebec. The basic wage in Ontario of 85c. is now up to 95.5c., including the cost-of-living bonus, while working bonuses are also paid by many Ontario producers. The recently completed contract at International Nickel set up $1.17½ as a basic wage for miners, plus a working bonus. Noranda and Waite Amulet have raised the miner's basic wage to $1.08 an hour; helpers, $1.00; laborers, 84c., effective July 1. This follows increases at Noranda of 13c. an hour following the 1946-1947 strike, and 10c. an hour on Aug. 16, 1947.

★J. C. Honsberger, consulting engineer, has reported a gold discovery in the Buteux Lake district, 100 miles northeast of Senneterre and 20 miles

east of the Macho River district. This is the first discovery reported for the area, with values from $3.68 across 3.5 ft. to $15.93 per ton over a width of 9.2 ft. Preliminary sampling has been done across a shear zone in quartz diorite, but heavy overburden has blocked efforts to uncover bedrock by means of trenching. Plans have been announced to fly in a diamond drill to the new property.

★As exploratory work gives encouragement in the Bachelor Lake district, where Dome Exploration and O'Brien Gold Mines report continued progress, a promising discovery of coarse gold has been reported in a new area located 40 miles to the west, near Burge Lake, Duplessis township. In this section active work is reported by Continental Copper Corp., O'Leary Malartic Mines, Leo C. Syndicate, and Bourcier Kuntz Syndicate. Prospecting has continued since last October along a mineralized shear zone in diorite. Progress has been slow, due to heavy overburden.

★Electric power demands for mines and communities in Northwestern Quebec have led to plans for enlarged power facilities by Northern Quebec Power Co., which will spend $4 million on a long term power project, increasing output from the present 40,000 hp. to 84,500 hp. in 1950. The power source on the Quinze River is near the head of Lake Temiscaming and the Ontario border.

ONTARIO

★Hasaga Gold Mines, Red Lake district, increased the mill rate to 420 tons in July and will be up to 500 tons a day before the end of the year, Charles Sheehan, manager, reported. Operating costs are expected to be reduced to $4 per ton, compared to average recovery of $6.90 per ton. Milling costs of 81c. cover straight amalgamation and cyanidation, with 97% recovery.

★Government aid to Madsen Red Lake Gold Mines will amount to $60,000 this year, according to W. R. Askwith, managing director. By next April the company expects to have mill additions working which will duplicate the present 400-ton unit, and the gold bonus then would increase to about $210,000 annually. Preparations are being made to deepen the shaft 600 ft. to provide another four levels. The mine is bottomed at the 11th level, where the grade is stated to be as good as has been encountered on any of the upper horizons.

★At Campbell Red Lake Mines the 4-compartment shaft is being deepened from 597 ft. to about 1,200 ft. to provide eight levels. Construction of a 115-ft. steel headframe is to be started in September. The Department of Mines' ore-dressing laboratories, in Ottawa, and the Dorr Co. are making tests for a roaster which the company will install before be-

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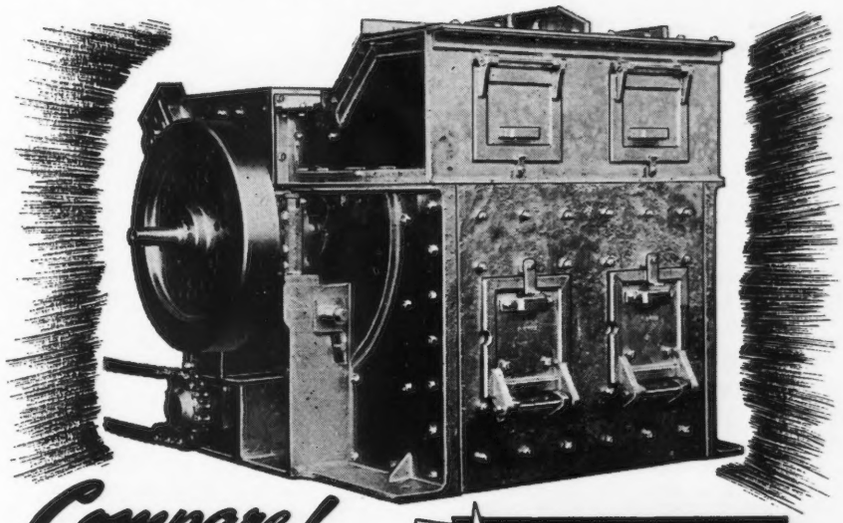

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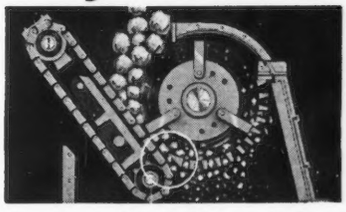

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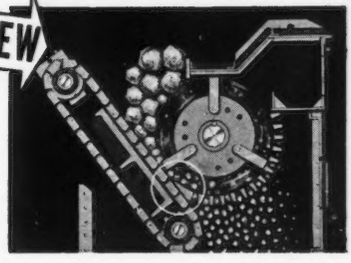

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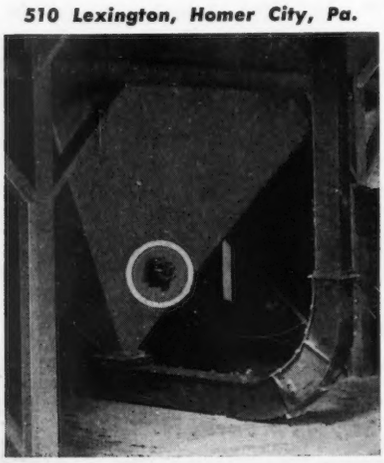

Ontario *(Continued)*

ginning production next January. Recovery of 95% is expected from the new mill. Foundations for the mill and crusher house are now complete and mill machinery is being moved to the property from the Quebec Dome subsidiary, Indian Molybdenum, Ltd. Report of ore reserves on May 31 showed an increase to 242,275 tons, almost the entire amount being blocked out in the south or "A" zone down to 550 ft. J. Chisholm is mine manager and R. Gosselin, general superintendent.

★Steep Rock Iron Mines has scheduled production to work up to a peak of 9,000 tons daily in September, with shipments for the season to exceed a million tons. At the southeast end of the "B" orebody new ore has been explored in addition to reserves of about 72 million tons, as last reported. Last winter churn drilling from the ice indicated additional length on the "B" ore zone. The "B" orebody has an average width of about 100 ft. and is upwards of 4,000 ft. in length. Both the "B" and "A" orebodies are nearly vertical and persist to considerable depth. Stripping costs, in spite of a 21% advance in wages, have been maintained on the 1947 level, with yardage removed this year by mechanical and hydraulic methods approximately 94% greater than in the same period in 1947. Shovels and trucks will handle about 2 million cubic yards this season and a similar amount is to be moved hydraulically. M. S. Fotheringham is vice president and general manager.

★Steep Rock Iron Mines, which earlier in the year announced plans to bring the "A" deposit into production, has applied to the Export-Import Bank, Washington, for a loan of $5 million to finance the work. It is believed that the orebody is capable of producing 2 million tons annually by open-pit methods. Fifty million cubic yards of lake bottom silt will be removed from Middle Arm of Steep Rock Lake in the north portion of which the "A" body is situated.

★The Sudore Gold Mines, Ltd., Ontario, on July 22 filed with the Securities and Exchange Commission a registration statement covering 500,000 shares of $1 par value common capital stock to be offered publicly at $1 a share American funds. There was to be no underwriting and funds received were to be used for exploration and development.

MANITOBA

★Ogama Rockland Gold Mines, Ltd., situated near Long Lake, in southeastern Manitoba, attained production status July 2, pouring its first gold brick valued at $37,496.00. This represented the first full month's production from treatment of 4,100 tons of ore. Present production rate is between 145 and 150 tons, with millheads grading approximately $15.00. Ore reserves estimated at year's end were 80,000 tons. A second shaft, parallel to present workings, is being put down on a shear zone which gave encouraging drill results.

★San Antonio Gold Mines, Ltd., has completed its No. 4 winze from the 16th to 26th level. Crosscutting is under way on the 17th level and the 26th level to intersect ore structure which gave good ore results on the 16th level. The labor situation has been eased considerably by the employment of DP's, and it is hoped to bring the mill back to 500 tons.

★Sherritt Gordon Mines, Ltd., is sinking a five-compartment shaft to develop the "A" orebody on its Lynn Lake property. A shaft will be sunk on the "EL" orebody following completion of the "A" shaft.

A new norite outcropping carrying nickel has been exposed 3,000 ft. south of the "EL" orebody. Diamond drilling has been started to outline this new plug. Deep diamond drill holes will be used to explore possibilities of a lower "EL" orebody.

Diamond drilling on the Barr option near Sherridon has been disappointing. An option has been taken on a group of claims at Weldon Bay, south of Sherridon, and adjoining ground has been staked by Sherritt Gordon to protect the showing. The first drill hole showed a big width of low grade mineralization.

★The International Nickel Company of Canada is active in the Lynn Lake area exploring ground it staked last year following airborne magnetometer survey, with interest centered on the 100 claim block, east of Cockeram Lake, where diamond drilling is in progress. Airborne geophysical investigations have been resumed in the northern part of the Province.

★In the Snow Lake area, Nor-Acme Gold Mines, Ltd. (Howe Sound Exploration Co. development) has completed the shaft to 1,000 ft. and is opening up the 320 level which will supply the bulk of mill feed for the first year. By 1949 the mill should be treating 1,500 tons daily.

★Tern Lake Mines, Ltd., has been incorporated to explore ground southeast of Howe Sound Exploration Co.'s holdings in the Snow Lake area.

★In the Flin Flon area, Callinan Flin-Flon Mines, Ltd., adjoining Hudson Bay Mining and Smelting Co., has announced plans for a deep drilling program to test anomalies recently outlined on their ground by the Radar Exploration Co.

★Hudson Bay Mining and Smelting Co. reports net earnings for the six months period ending June 30, 1948, amounting to $7,591,950, compared with $6,046,157 in the corresponding period of 1947.

★Jowsey Island Gold Mines, Ltd., was

to hold a special meeting August 11 to consider a proposal to wind up the company's affairs. God's Lake Gold Mines, Ltd., owns 1,200,000 shares of Jowsey Island stock.

★Lingman Lake Gold Mines is negotiating to acquire the mill and power plant of God's Lake Gold Mines, Ltd., at God's Lake.

★Figures released by the Dominion Bureau of Statistics show that 60,354 fine oz. of gold were produced by Manitoba and Saskatchewan during the first four months of 1948, compared with 56,963 oz. for the same period in 1947.

SASKATCHEWAN

★Resources Minister J. L. Phelps on July 22 announced discovery of iron oxide accompanied by indications of copper, zinc and nickel mineralization in northwest Saskatchewan 5 miles south of Macoun Lake. Earlier in the month the area was withdrawn from staking, in accordance with the Provincial Government policy of protecting individual prospectors working under government assistance, when Bill Archer and Eric Partridge, prospectors, first located a mineralized zone giving promise of important base metal potentialities. W. James Bichan, Director of Mineral Resources, explained that, due to the depth of the oxidized zone which in places has been traced downwards for 7 or 8 ft., no representative samples of the true value of the primary mineralization could be recovered and that for this procedure a diamond drill would be used.

★The Resources Minister has announced a find at the north end of Waddy Lake, about 100 miles north, northeast of Lac la Ronge, consisting of a shear zone carrying considerable gold value. Wendall Bryanton and James Smith, of Consolidated Mining and Smelting Co., made the discovery last fall, and the Consolidated company had staked 17 claims on the property at the time of the announcement.

BRITISH COLUMBIA

★Third-round wage increases in industry and the ability of base metal mines to meet demands for higher wage scales are adding to the difficulties confronting gold mines. The famous Silbak Premier mine in the Portland Canal district has closed down because of inability to meet labor demands for a retroactive wage increase. Majority report of a conciliation board has recommended a 10c.-an-hour wage increase for employees of the Cariboo Gold Quartz Mining Co. at Wells, and a second conciliation board has recommended a similar increase for Island Mountain Mines Co. employees.

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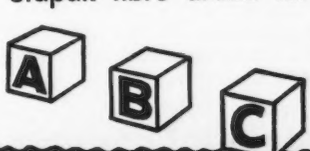

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British Columbia *(Continued)*

In the case of Cariboo Gold Quartz, heavy development expenditures coupled with reduced output resulted in a serious financial loss on operations during the last fiscal year, and the company has advised that it is unable to meet the proposed new wage increase and will close down if employees persist in their demands. At Island Mountain it is expected the company will follow a similar course.

Conciliation boards for Bralorne Mines, Ltd. and Pioneer Gold Mines of B.C., Ltd. were expected to report their findings early in August. While the Bralorne mine is able to show an operating profit, Pioneer is spending large sums on development and showed a net loss of more than $150,000 in the last fiscal year.

★The British Columbia Department of Mines has announced that a discovery of radio-active minerals "in place" has been made in that Province. Extent of the deposit, discovered by a prospector, had not been determined and no details as to location made public early last month.

★A three-months extension for completion of assessment work on mineral claims which was to have been completed between May 25 and August 25, where such work was interrupted or delayed by flood conditions, has been granted by the B.C. Department of Mines.

★Shipments of ores and concentrates from custom mines to the Trail smelter during the four-weeks period ended July 24 were 5,900 tons. Of this, 1,100 tons went to the lead smelter and 4,800 tons to the zinc plant. Among important shipments from outside the Province were: American Metal Co., Callao, Peru, 1,928 tons of zinc concentrate; Goldfields Consolidated Mines, Northport, Wash., 810 tons of zinc concentrate; New Calumet Mines, Campbell's Bay, Que., 106 tons of lead concentrate.

★A new rod mill, believed to be the largest of its kind ever constructed, has been ordered for installation in the sink-and-float plant at the Sullivan mine of Consolidated Mining & Smelting Co. Designed by a U. S. firm, the rod mill will have a diameter of 11 ft. 5 in. and will measure 12 ft. in length. Rods will be a mixture of 3-in. and 3½-in., weighing 95 tons. The mill will be powered by a 720-rpm., 1000-hp. synchronous motor.

★A donation of $50,000 has been made to the Kimberley Red Cross Relief Committee by Consolidated Mining & Smelting Co. for rehabilitation of the flood damaged community at the Sullivan mine.

★Showing a slight increase in ounces of gold produced from a smaller tonnage milled as compared with the previous month, Island Mountain Mines Co. reported production for June was 1,355 fine oz. of gold from 3,176 tons milled.

★Plans for increased mill capacity at the Polaris-Taku mine of Taku River Gold Mines in the Atlin district have been postponed. To meet present high costs additional emphasis is being placed on selective mining in an effort to maintain millheads of 0.4 oz. gold as compared with a previous average of approximately 0.3 oz. Production during May was 3,104 oz. from 7,840 tons milled; in June 3,112 oz. from 8,170 tons.

★A diamond-drill intersection assaying 2.07 oz. gold across 44 in. and a parallel intersection assaying 0.46 oz. across 22 in. have been reported from the Salmon gold mine under development by Morris Summit Gold Mines. The new intersections, approximately 100 ft. below the main haulage level, represent the first confirmation that the high gold value obtained in development above the main haulage horizon continues below that level.

★An extensive program of exploration and development is planned for the Copper Island property, formerly the Newman mine, at Babine Lake, to test promising silver-lead-zinc mineralization. Work previously done on the property by Consolidated Mining & Smelting Co. indicated a large tonnage of low-grade copper ore containing small amounts of gold and silver.

★Beavermouth Dredging Co. has completed a two-weeks shakedown test of its new dredging operation on the Cottonwood River, Cariboo district. While tailing losses have been heavy, the test period has demonstrated that previous sampling of gravel reserves was accurate. Edward Nepple of Seattle, Wash., president of the company, estimates that the new plant dredged 100 cu. yd. per hr. with an hourly yield of $100. With tailings losses estimated at about 50%, the high gold content of the alluvial deposit becomes apparent.

★During the second quarter of 1948 Bralorne Mines recovered 19,420 oz. gold valued at $679,000 from 38,488 tons averaging 0.5 oz. gold per ton. Production figures for the first half of the year show 39,329 oz. valued at $1,376,515 from 75,499 tons averaging 0.52 oz. gold per ton.

New ore of better-than-mine-average grade has been opened on the 11th level; on the 16th level additional ore of slightly lower grade was found. Exploration at the Shulaps Mountain property in the Yalakom district has been suspended until parts of the road destroyed by floods can be rebuilt.

★Hedley Mascot Gold Mines plans to mine out remaining ore in the Mascot Fraction before any ore in the lower levels of the property is extracted. Following the completion of mining in the Mascot Fraction, expected to take about six months, consideration will be given to the possibility of closing down operations pending the return of better conditions for gold mining. Recent work has not en-

larged orebodies on the Nick-of-Time and Copper Chief claims.

★Sheep Creek Gold Mines has suspended milling at its Salmo district parent property but will continue development, pending return of more satisfactory labor and economic conditions. The subsidiary, Zincton Mines, continues to make regular shipments of lead and zinc concentrates, with production considerably greater than last year. Having obtained operating control of Vananda Mines (1948), Ltd., a gold-copper producer, Sheep Creek is now preparing that property for production. The new mill will be in operation next month, with concentrates going to the Tacoma smelter. A 50-ton mill is also planned for the Parridice silver-lead-zinc mine in the Windermere district, where developed ore reserves are estimated at 50,000 tons containing 8% lead and 12% zinc.

★Kootenay Central Mines, operator of the Midnight mine at Rossland, has acquired the adjoining I.X.L. property on a lease and purchase option. Both properties produce high-grade copper-gold ore and have been shippers to Trail smelter for many years. A diamond drilling program on the I.X.L. property will be started immediately by the new management.

★The increase in the E&MJ price for copper will be followed automatically by payment of a copper bonus to crews at Britannia and Granby Consolidated mines under a wage agreement. The bonus goes into effect 30 days after the price rise is quoted by E&MJ. This was the announcement in Vancouver Aug. 3, following announcement by Phelps-Dodge of a 2c. per lb. advance in copper, bringing the price to 23½c. To date, B.C. copper miners, under a sliding scale, are receiving four copper bonuses of 25c. each arising from price advances.

YUKON

★Yukon Consolidated Gold Corp. was reported to be employing over 500 men in July and operating dredges at Bonanza, Dominion, Lower Klondike, Lower Sulphur, Middle Hunker, Middle Sulphur and Quartz Creeks.

★United Keno Hill Mining Co.'s May production amounted to $170,000 with 152,000 oz. of silver and 326,000 lb. lead, or a rate of 115 tons daily. By the end of July production was expected to reach 150 tons daily, and by September about 200 tons. Operating profits will be about one-third the production. In July the company's stockpiles amounted to 2,500,000 lb. lead and 1,000,000 oz. silver with valuation at over $1,000,000 at the July prices.

★Yukon Gold Placers, Ltd. will use the 1948 season for ground stripping on Henderson and Thistle creeks and go into full production next year with the two dredges, according to E. N. Patty, president.

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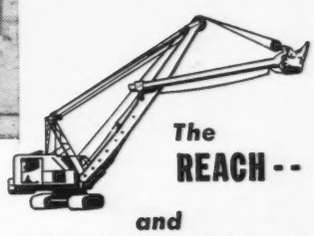

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MEXICO

Labor wins wage increases, other benefits—Las Truchas iron deposits go to national reserves

★Mining shared the general uncertainty of the business industrial situation, which became more unsettled with the Government's decision on July 21 to devaluate the peso, thus ending the 4.85-peso-per-dollar rate in effect since Sept. 1939. The Bank of Mexico had suspended foreign exchange trading until an official peso-dollar rate was fixed. Meanwhile, there was considerable unofficial trading in dollars at rates ranging from 6 to 6.60 pesos. Mining was encouraged by price rises in the U. S. of lead, copper and zinc, and increasing demand for these metals north of the border.

★Victory for labor with combined wage increases of some 60 million pesos (about $10 million) and numerous costly social benefits, after revision of 90% of collective work contracts, was announced by Agustin Guzman V., secretary general of the miners' union. The life of the revised contracts is two years. Forty-five strikes, involving 35,000 workers, were called "as the workers were obliged to strike in defense of their legitimate rights," said Guzman.

★Clauses in the revised labor contracts with the miners' union provide that some 100 sons of members shall attend the National Polytechnic Institute, Mexico City, at the expense of their fathers' employers, the union has announced. Monthly support cost of each student was raised from 200 to 400 pesos ($36 to $72), and each now gets free first-class round-trip transportation for annual vacations.

★Section 65 of the miners' union lost a precedent-making labor case when the Mexican Supreme Court ruled that ousting of two members from Cananea Consolidated Copper's employ by Section 65, exercising the contractual exclusion clause against the members, was unconstitutional. The Court ordered the men reinstated in the company's employ and in good standing in the section, and ordered the section to pay wages in full for the time the men were unemployed.

★Important deposits of gold, lead, tungsten, graphite, iron, mica, baryte and gypsum were located in various parts of Oaxaca by the four groups of geologists sent there by the Investigations Institute of Resources of the Republic, announced Ing. Jose Gonzalez Reyna, director of the Institute.

★Concession to six iron deposits known as Las Truchas, on the Michoacan-Guerrero line, 21 miles from the Pacific coast, were cancelled because of failure by holders of the concession to perform development work within the specified time, and the deposits have been incorporated in the national mineral reserves. The Mexican Government intends to found a company to exploit these deposits and will build a small port on the Pacific coast to facilitate sea shipment of Las Truchas ore.

BRAZIL

Geologist reports manganese ore at São Domingos da Prata—Prospecting active in Central Minas Gerais

★The Joint Brazil-United States Technical Commission has been formed to analyze factors in Brazil which are tending to promote or retard the economic development of the country. Brazil's natural and capital resources, the supply of labor, problems in fiscal and banking fields, problems of domestic and international trade and the position of Brazil in the world economy are subjects to be incorporated in the commission's report. Appraisal of specific projects or evaluating desirability of foreign capital will not be undertaken; however, the commission will consider measures designed to encourage the flow of private capital to Brazil and, where appropriate, may make broad recommendations relative to measures which might facilitate economic development in Brazil.

John Abbink, chairman of the board, McGraw-Hill International Corp., has been given the personal rank of Minister, to head the United States section of the joint commission. Heading the Brazilian section is Dr. Joao Daudt d'Oliveira. The Brazilian and U. S. sections will each consist of three members to be assisted by a technical staff furnished by their respective governments.

★Mr. Djalma Guimarães, geologist for the State of Minas Gerais, reported that a reserve of 1,821,000 tons of 46% + manganese ore was blocked out at the new São Domingos da Prata, Eastern Minas Gerais, manganese mine, owned by Empreza Continental de Minérios, Ltda. Field work was done by Geomina, Ltda., metallurgists and mining engineers of Rio de Janeiro, for the Departmento Nacional da Producão Mineral. Lenses of lower grade ores were also prospected and 4,767,000 tons of 40% ore and 1,957,800 tons of 36% ore were also blocked out. São Domingos da Prata is the largest manganese deposit discovered in the last 10 years and its reserves are the country's third largest.

★As the price of tin in the domestic market last month reached a new high of $60 per kg., following the up-

ward trend of the international prices, the tin belt around São João d'El Rey, Central Minas Gerais, was the site of an active prospecting campaign. Cassiterite found in that zone in several placer deposits caused a rush of prospectors in 1943. Last year it was discovered that some pegmatites and greisens intrusive in the local rocks of the Minas series yielded good values in cassiterite. A drilling campaign is now under way at Volta Grande, Mamonal and Nazaré mines, and workable grades of ore are being blocked out. It is anticipated, however, that large scale mining and milling will be required as the mineralization is rather irregular.

★The Maravilha mine, in the southern part of the Saude district, was under detailed mapping and sampling and a reserve of 110,000 tons, of 20 grams of gold per metric ton (about 0.65 oz./t), was proved. Exploitation was to start soon and an all-slime mill to be erected near the mine.

★Brazil produced 451,507 tons of manganese in 1947, the highest production in 10 years. Gold production, according to official preliminary figures, was 4,198,419 grams in 1947.

PERU

★The concentration plant erected by the Banco Minero del Peru at Huachocolpa, south of Huancavelica, was officially inaugurated on July 20 and is now in full operation. During the war the Banco Minero made a thorough investigation of the region and recommended the installation of a 150-ton selective flotation mill. The plant, which functions as a custom mill, was designed during the war years, but difficulties in obtaining machinery at that time and the task of transporting and installing equipment in such a high and distant region delayed the conclusion of the project.

The plant consists of two ball mills, classifiers and flotation cells. Power is generated by means of three diesel engines. The plant is 14,500 ft. above the sea and this factor played an important part in the general design.

The most important mines in Huachocolpa are Caudalosa, Rublo, Peseta, and Emita, containing ores with values in zinc, lead and silver. The Banco Minero, during the construction of the plant, financed the development of these mines and there are now substantial reserves of medium-grade ore.

★The Julcani mines, Department of Huancavelica, which had been taken on option by Cerro de Pasco Copper Corp., have now been rented for a number of years by that same company. Julcani has two types of ore: sulphides rich in silver, and oxidized ores containing chiefly gold. The silver ores have indicated excellent possibilities.

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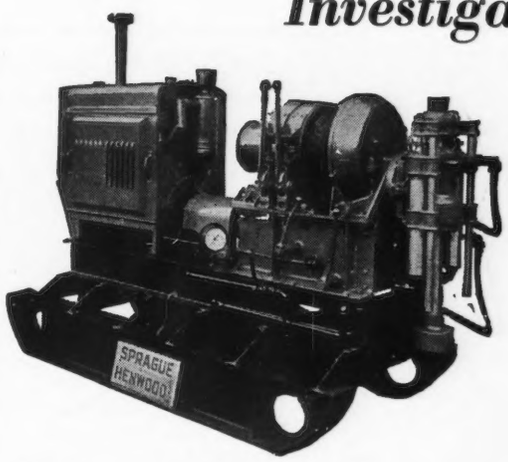

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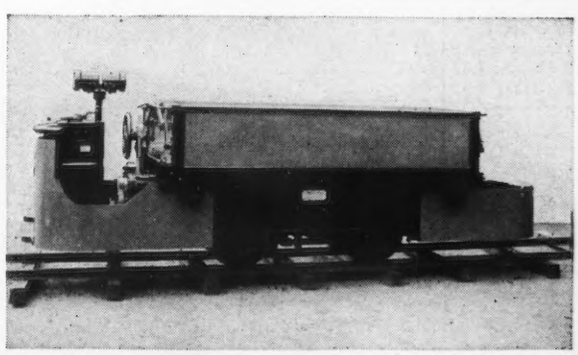

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PHILIPPINES

Court orders Benguet to grant wage increase—Misamis Chromite is a new high-grade producer

★June production at the Benguet-Balatoc mill was $266,800 from 36,200 tons milled. This was slightly larger than the May output, with mill-heads a little better in grade. The Atok-Big Wedge mill reported $199,000 production in June from 13,313 tons averaging $15 per ton. This was a post-war record in tonnage milled, but mill-heads were lower than in May. No. 2 shaft is being sunk to the 800-ft. level, and the 720-ft. level is being prepared for mining. No. 3 shaft has been completed to the 500-ft. level. The power plant has been enlarged to provide for an expanded exploration program besides normal mining and milling requirements.

★Lepanto Consolidated began milling at its new plant as scheduled on June 26 with satisfactory operating results. Present mill-heads are reported to run about 4.5% copper and 0.15 oz. gold per ton. First shipments of concentrates will be made to the U. S. in September.

★Consolidated Mines, which is operated by Benguet-Consolidated on the Masinloc chrome deposit, shipped 20,000 tons of ore in June. In a decision involving the company made by the Court of Industrial Relations, the operating managers were ordered to grant substantial wage increases to the miners, with all increases retroactive to May, 1947. It is reported that Benguet expects to appeal the decision to the Supreme Court if necessary. While the decision only affects the Masinloc operations, it is possible that it may be more far-reaching in its practical effects, and influence the wage structure in other mining areas as well, notably at Acoje, 50 km. away, where initial postwar production of chromite has just begun.

★June production at Surigao Consolidated was $72,600 from 6,192 tons, an average of $11.75 per ton recovered. This compares with $62,500 from 5,635 tons in May, or $11 per ton. The bullion was sold on the open market in Manila at prices averaging $45 per oz. The mill is operating at only half rated capacity, but more ore will be hoisted as soon as the 400-ft. level is prepared for mining. Recent laboratory tests have indicated that by making changes in the mill circuit the company can recover a larger proportion of its gold in the form of bullion rather than in concentrates, thereby effecting a considerable saving in shipping and marketing charges.

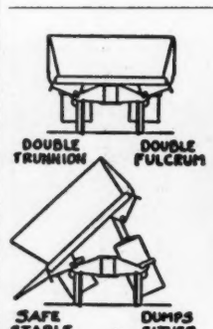
★Misamis Chromite, a new chromite producer in Misamis Oriental Province, Mindanao, has begun shipping high-grade ore under the operating management of International Engineering Co., a Soriano subsidiary. Developed ore reserves are limited, but in the opinion of examining engineers, the indications are good that large additional tonnages will be found.

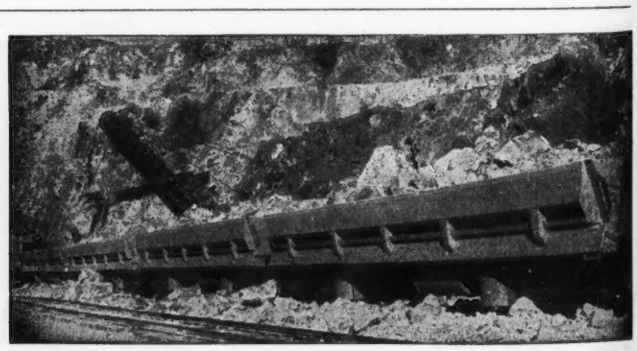
★Considerable pressure is being brought to bear on government authorities to permit an early resumption of normal trade relations with Japan, especially with respect to shipping iron ore there from the Philippine iron mines, idle since the war.

AUSTRALIA

Central Norseman continues prospecting and development—Mt. Isa plans increased operations

★To continue the prospecting of the Mararoa vein northward, and for economic mining of the northern ore, Central Norsemen Gold Corp., N. L. has begun the sinking of a new shaft about a mile north of the Phoenix. At a depth of 1,000 ft., a new reef was cut which assayed 11 dwt. gold per ton over a width of 36 in.; pos-





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sibilities cannot be assessed until exploratory work is carried out. Working from winzes on the northern ore shoots, driving at the No. 25 level has proved ore for a length of 554 ft.; the assay value is 11.1 dwt. gold per ton over a width of 59 in., and both north and south faces are continuing in good ore. Boreholes into the hanging wall side of the drive show greater widths of quartz over much of the length exposed.

The Princess Royal shaft about four miles north of the Phoenix shaft is developing a strong shear beyond the workings of an old company which mined a group of outcropping oreshoots. In the north extension of the shear, diamond drilling intersections of 40 dwt. over 18 in. and 56 dwt. over 41 in. have been obtained, and driving on the No. 7 level north has shown 230 ft. of ore, assaying 10.7 dwt. over 75 in. The grade of Princess Royal has averaged 15 dwt. compared with 7 to 8 dwt. at the Mararoa reef. Geological mapping has been completed, and deep drilling from the No. 9 level is about to begin.

A new shaft has been sunk on the incline to 400 ft. at the Lady Miller mine, three miles south of the Phoenix, to mine oreshoots located in sediments bedded between lava flow. Development has just begun north and south from the shaft.

For the year ended March, 1948, Central Norseman treated 112,237 tons of ore which was an increase of 2,313 tons over the output for the previous year; there was a decrease in gold recovery, however, from 38,342 fine oz. to 35,691 fine oz. Plans are for production of 10,000 tons of ore per month when hoisting can start from the new shaft at the north end.

★Great Boulder Proprietary Gold Mines, Ltd., Kalgoorlie, in the quarter ended March 31, treated 69,492 tons of ore for the recovery of 15,369 fine oz. of gold.

★Continued rise in costs has prompted Paringa Mining and Exploration Co. to postpone the proposed addition of a 50,000-ton-a-year unit to the mill to handle marginal grade oxidized ore from upper levels.

A new ore channel that has disclosed payable values is being opened up in the Paringa mine, and a new drive at 976 ft. from the South shaft is underway to tap a borehole find of 99.7 dwt.

★In May, the production of Mount Isa Mines, Ltd. was 57,560 tons of ore for the recovery of 3,100 tons of silver-lead bullion and 4,750 tons of zinc concentrate. Transport of zinc concentrate to Townsville, 600 miles distant, for shipment overseas, is difficult because of shortage of railway wagons. Only 700 tons out of a weekly production of 1,200 tons can be shipped, and the accumulation of concentrate at the mine amounts to 45,000 tons, worth £A540,000. In an effort to improve the fuel position, the company is prospecting coal-

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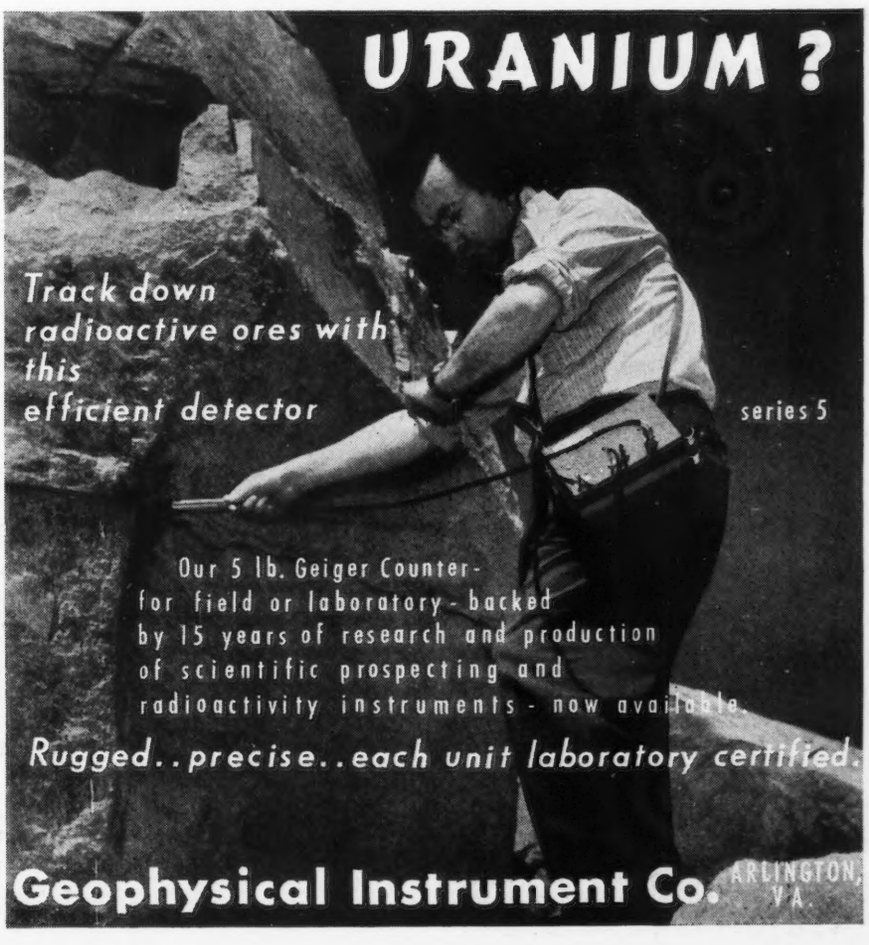

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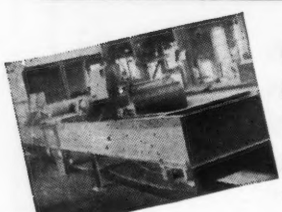

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Australia (*Continued*)

bearing areas in the north-central district of the State.

Approximate ore reserve figures are over 7 million tons of silver-lead-zinc ore and 2 million tons of copper ore. During the war production was centered on copper; work on this section of the mine has ceased until the completion of a new copper concentrating and smelting section of the plant. No. 2 ore shaft is being enlarged and through it ore from both the lead-zinc and copper sections will be hauled to surface and discharged from eight-ton skips into separate ore bins for transfer to the respective milling plants.

The lead concentrate is smelted at the mine; the grade is 25 oz. Ag. and 37% Pb., recoveries being Ag. 73% and Pb. 75%. The zinc concentrate must be shipped overseas, so recovery is subordinated to grade; the assay value of the concentrate is 51% Zn. and the recovery is 53%.

The company has erected 400 houses for married staff and other employees, and flats, dormitories and barracks provide accommodation for 500 employees. Increased accommodation, approximated at 200 houses, will be necessary for the increased scale of operations in both lead-zinc and copper sections. The cost of this housing; the new mill for copper ore, with a capacity of 36,000 tons of ore per month; and the modern copper smelter, with a capacity of 1,500 tons of blister copper per month, is estimated at £A2 million.

★The lead industry at Broken Hill pays the highest minimum wages in Australia to its workers and the highest rates of dividend to its stockholders. The mines' 4,500 workers will receive a lead bonus of $32.30 a week from the first payday in August. The lowest-paid mine worker will then make $54.50 a week including base pay, which is more than twice the "basic wage" of about $22 a week that most Australian workers find in their pay envelopes.

6 Ways Nicholson Units
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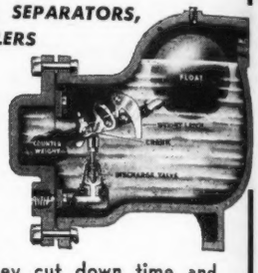
ON
RECEIVERS, SEPARATORS, INTERCOOLERS



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AFRICA

Marievale Consolidated sets tunneling record—Canadian company plans bauxite plant in Los Islands

★A specially outfitted Douglas transport plane landed at Lourenco Marques, Portuguese East Africa, in July to begin a 6 to 12-months program of serial mapping and airborne magnetometer survey in a search for new oil resources. A concession area of 45,000 sq. mi. has been granted to the Mozambique-Gulf Oil Co., a wholly owned subsidiary of the Gulf Oil Corp., for exploration and development.

Aero Service Corp. of Philadelphia is making the survey and reports that the airborne magnetometer will perform magnetic reconnaissance at the rate of 150 m.p.h. The 15-man survey party includes pilots, mechanics, radio operators, photographers, electronic engineers and mapping experts.

★Springs Mines, Ltd. and West Springs, Ltd. amalgamated on July 1, with West Springs to be liquidated voluntarily after a transfer of property and shares. Shareholders were to be asked to approve the proposals at the end of the month. Reserves in the older parts of the 2 mines are approaching exhaustion, and falling grades and increased costs make it difficult to maintain even present low level of profits. By the amalgamation it will be possible to close a portion of the reduction plants and dispose of them, with an estimated reduction of expenditure of £10,000 a month.

★A new Rand record for tunneling from a working shaft has been set up by Marievale Consolidated. In 26 working days a crosscut to the Kimberley Reef from No. 1 Shaft was advanced 1,227 ft. Previous record was 1,132 ft., achieved by Grootvlei Proprietary Mines early this year. The development rock was hoisted up the shaft which was already carrying the whole of the mine's output.

★June quarterly reports on the Free State mines show Western Holdings

No. 1 Shaft had reached 60 ft. and sinking was proceeding with temporary winches. Free State Geduld No. 2 Shaft was down 40 ft.

St. Helena No. 3 incline shaft had reached a depth of 2,748 ft., passing through the Leader Reef. Over a distance exposed of 95 ft. this reef averaged 1.4 dwt. over 32 in. A borehole 2,560 ft. from the shaft collar, where the Leader Reef was exposed in the shaft, intersected the Basal Reef, the value being 51.0 dwt. over 5 in. No. 4 vertical shaft was sunk 175 ft. to a depth of 607 ft. from surface.

At Freddies North, No. 1 shaft was advanced 3 ft. and had reached a depth of 51 ft. June 30. Sinking of this shaft has been suspended to allow erection of the permanent headgear. No. 2 Shaft was advanced 232 ft. and had reached a depth of 284 ft. At Freddies South, No. 1 Shaft was advanced 213 ft. and had reached a depth of 261 ft. No sinking operations were carried out at the No. 2 Shaft as the erection of the permanent headgear is in progress.

Welkom No. 2 Shaft was sunk 229 ft. to a depth of 487 ft. The wooden headgear was completed and sinking hoists installed. No. 1 Shaft collar is complete and work proceeding on erection of hoists and other equipment.

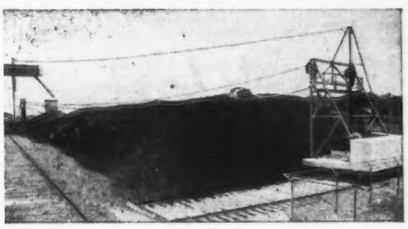
★Union Miniere du Haut-Katanga, copper producer in the Belgian Congo, has announced plans for a $68,400,000 development program, to include hydro-electric power stations producing a billion kilowatt-hours annually, and construction of an electrolytic zinc refinery. The company had a net profit for 1947 of $18,100,000 compared with $13,600,000 for 1946.

★In its mid-year statement to stockholders, Aluminium Limited of Canada revealed that engineering and construction staffs will leave in the next few months to begin work on the construction of a bauxite crushing and drying plant, anchorage and ship-loading facilities in the Los Islands, adjacent to the French Guinea mainland, about 500 miles southwest of Dakar. Development of the bauxite deposits on these islands is expected to produce 250,000 tons of bauxite a year for the company's Canadian reduction plants, thus supplementing supplies from British Guiana. Initial capital expenditure on the project will amount to $6,500,000.

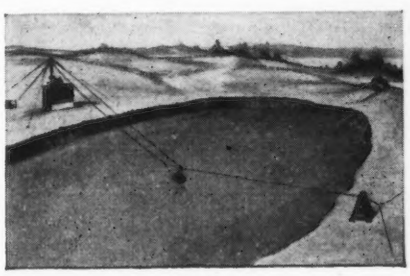
★City Deep, Ltd. and Nourse Mines, Ltd. announce that agreement has been reached in principle on a proposal for amalgamation of the two companies in the Corner House Group. The ground on the dip of the old part of Nourse is said to be awkwardly situated, and the move should effect working economies for both companies.

★The Vanguard Asbestos Mines, Ltd. has been registered in Salisbury to work a claim area in the Belingwe district about 100 miles east of Bulawaho. The strike is two and one-half miles long and one-half mile wide.

Sauerman LONG RANGE MACHINES



Sauerman Scraper machine with self-propelled tail tower provides rapid means of storing and reclaiming large tonnage on limited area.



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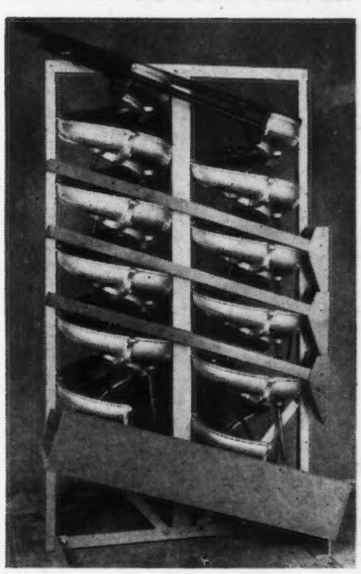
★Prospectors interested in samarskite deposits in Mozambique have offered £300,000 (about $1,200,000) for a mine in the Tete district. Assay reports show the samarskite contains uranium, thorite, tantalite, niobium, beryl and zircon. More than 100 applications for mining rights have been made to the Mines Department.

★Consolidated Murchison (Transvaal) Goldfields and Development Co., Ltd., produced 6,140 tons of antimony concentrate and cobbed ore last year and 1,815 tons the first quarter of this year. Antimony orebodies being worked in 2 shafts in the Northern Transvaal give no indication that they will fail at persistent depth. Gold production last year was 8,069 fine oz., with 2,705 fine oz. for the first quarter of 1948.

Because its mining operations are aimed primarily at producing antimony, the company has appealed to the Special Income Tax Court to alter the basis of its taxation from a gold mine to a base metal mine, a previous application to the Commissioner of Inland Revenue having been rejected.

★It has been proposed to introduce at the September session of the Legislative Council in the Gold Coast a bill to impose a duty on gold won. If this bill is approved, the duty will come into effect on October 1, 1948, from which date the existing gold export duty will be repealed.

HUMPHREYS SPIRAL CONCENTRATOR



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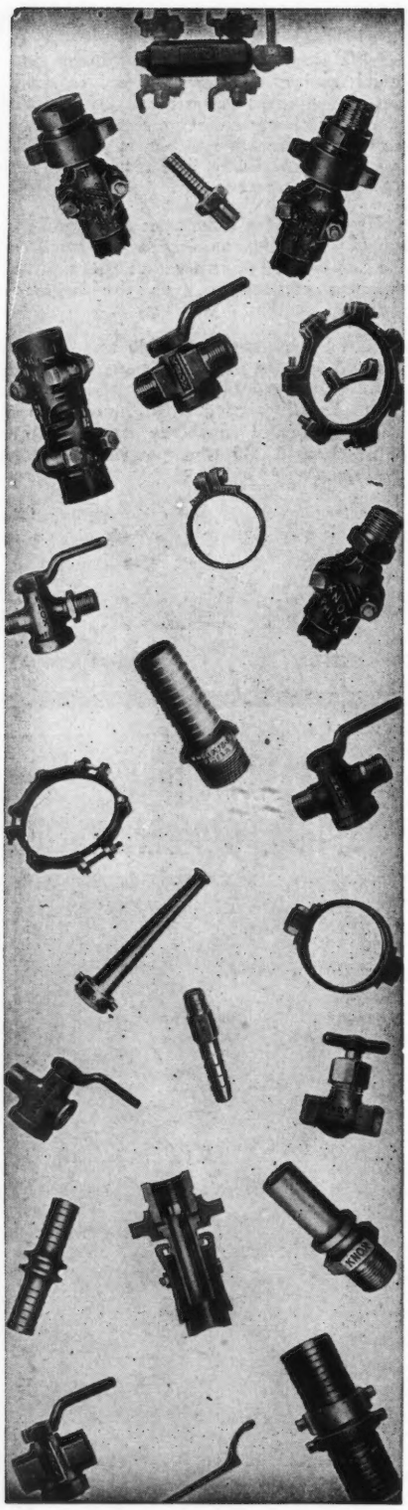

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News of Industry

(*Continued from page* 103)

because of the depression that year and partly because it could not compete with the Lake Superior waterborne ore. During its operation about 500,000 tons of ore was mined.

The Old Sterling mine includes not only the mine by that name but the Dickson and Keene mines which were opened just about a century ago by James Sterling. The Old Sterling itself is an open pit approximately 500 by 200 ft. and 115 ft. deep. In addition, there are underground workings reaching to a depth of about 200 ft. Old Sterling was last operated during the first decade of the 1900's and has produced over three-fourths of a million tons of ore.

Lead Company Takes Stand Against International

St. Joseph Lead Co., whose mining, milling and smelting operations in Missouri terminated in July as a result of a strike by Locals 532 and 648 of IUMMSW, has made the following statement in a report to stockholders:

"It is believed that the company's wage rates have been, and are among the highest, if not the highest, in metal mining and compare most favorably with earnings in other industries throughout the St. Louis area. Due to the company's lead price scale adjustments of 25c. per shift for each 1c. change in the lead price above 12c. per lb. New York, the employees have received an increase during 1948 of $1.13 per shift, which when added to the company's offer of 37c. per shift in the basic wage rate for waiving the so-called 'fringe' issues . . . amounts to $1.50 per shift. . . . Many of the large mining companies have renewed contracts with their employees on the basis of an increase of 12c. per hr. and the waiving of 'fringe issues'.

"There have been no negotiations since July 7, 1948, as this Company is convinced of the Communist influence in the International Union of Mine, Mill and Smelter Workers, because of the disclosures of the CIO's own investigation of this international, and because of the statements of many local unions that have seceded from the same international. . . . The company stands ready and willing to deal with any representatives the employees may choose, but definitely will not deal with any representatives of a Communist influenced organization."

Casting Division Locals Leave MMSW for UAW

As predicted last month, (E&MJ, Aug., P. 104) the 24 casting division local unions which voted to pull out of the left-wing Mine, Mill and Smelter Workers, CIO, over the Communist issue, will not be rechartered by the CIO as the National Association of Die Casting Workers, and they will stay in the CIO. A haven has been given the 20,000 MMSW members by the right-wing CIO United Automobile Workers, headed by Walter P. Reuther. UAW-CIO's executive board approved affiliation on August 4, thus raising the auto union's rolls to almost one million. The merger is the second for the casting workers since they became a CIO affiliate as NADCW in 1937; they joined MMSW in 1942.

The switch to UAW-CIO was not a complete surprise, since this union recently had taken over bargaining rights at several casting plants where MMSW could not hold its contract because of failure of its officers to file non-Communist affidavits under the Taft-Hartley law. The 24 locals have agreements with some 114 casting companies, including many in Chicago, Cleveland, Toledo, Detroit, New York, Kansas City, St. Louis and on the West Coast.

The shift to UAW-CIO will have special significance to those employers having contracts with the locals involved. Not only will the contracts be changed to make UAW-CIO a party, but management can expect to face the same contract demands made on the automobile industry every year. Many employers affected are suppliers for the auto and aircraft industries in which the UAW-CIO is dominant.

The MMSW locals will become regular locals of UAW-CIO, which plans to establish a die casting workers department and a wage-and-hour council of all locals in the "casting or related industries." This will be for the purpose of joint planning and action for bargaining with employers in the industry.

The walkout of MMSW and into UAW was led by Kenneth Eckert, director of the MMSW castings division, who has turned against the Communism he once believed in, and is now branded as a "renegade" by the New York *Daily Worker*, and as a "deserter and traitor" by the Ohio district of the Communist Party. The defection is the second to strike MMSW in two years. Last year 40 locals with some 30,000 members, dissatisfied with MMSW leadership because of Communist domination, moved over to the CIO Shipbuilders' Union.

A. S. & R. Signs Contract With Local Unions

An item on page 102 of E&MJ, August, was open to some misinterpretation. The fact is that contracts negotiated by American Smelting & Refining Co. with its 14 divisions were on a strictly local basis. No international officer of MMSW signed any of the contracts and dealings were wholly with the local officers.

Personal News (*Continued*)

himself, in the hearts of his friends and in all his affiliations, will always remain a tribute to a splendid and loyal American, an inspiration to all who knew him.

An Appreciation of Leo J. Hoban

The life of Leo J. Hoban is another shining example of the opportunities presented to youth of humble origin in this country. He was born in 1892 at Fergus Fall, Minn. His early youth and the balance of his life was spent in the Northwest. Although a graduate of Gonzaga University, Spokane, Wash., he was essentially self-taught. He was a thorough student of any subject presented to him, and was possessed of a clear, analytical mind with which to consider them. Taxation laws and procedure early gained his attention and became his chief study. He became a member of the Tax Committee of the American Mining Congress and earned the respect of such experts as Henry Fernald and E. C. Alvord.

He entered the employ of Hecla Mining Co., Wallace, Idaho, as a stenographer at the age of 18 and remained in its employ for the balance of his life, with the exception of two years in Army service in 1918-19, from which he returned as a second lieutenant. He advanced as the company expanded and served successively as accountant, office manager, controller and secretary-treasurer. He became a director of the company in 1940, and at the time of his death was also a director in Sullivan Mining Co., Polaris Mining Co., Silver Summit Mining Co. and the First National Bank of Wallace.

He was active in civic matters, and a generous supporter of many youth activities. His passing will be keenly felt by his business associates and his many friends.

L. E. Hanley, President
Hecla Mining Co.

LETTERS

Canada's Gold Estimate

To the Editor:

It has been called to my attention by an official of the Foreign Exchange Board in Canada that my statement (E&MJ, July, p. 77) regarding an estimate of gold production of the world by the Foreign Exchange Control Board is technically incorrect. They tell me that the Foreign Exchange Control Board has not made its own estimate but simply quoted an estimate by other authorities.

I hope this explanation will avoid any unfair news to the Foreign Exchange Control Board.

Yours very truly,
Ira B. Joralemon
San Francisco, Calif.

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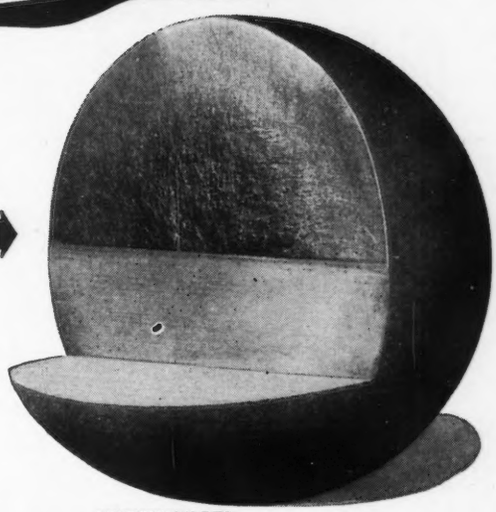

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